

THE IRON AGE

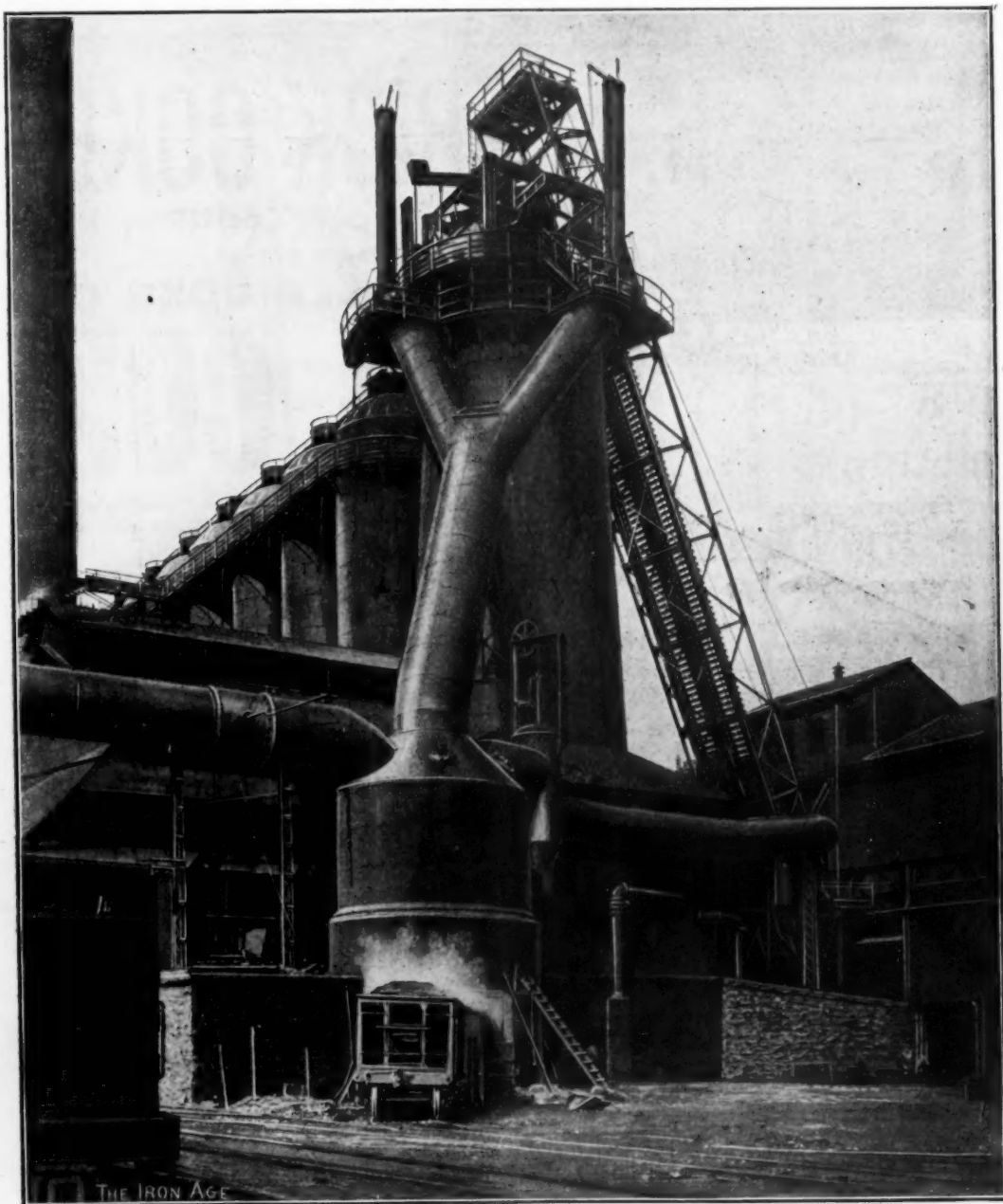
THURSDAY, OCTOBER 31, 1901.

The Eliza Furnace Plant.

(With Supplement.)

The American Iron and Steel Works of Jones & Laughlins, Limited, is located on both sides of the Monongahela River, in Pittsburgh. The output consists of pig iron, Bessemer, basic and acid open hearth blooms

machine shops are situated on the South Side; their coke plant, blast furnaces and heavy plate mills are on the north side of the river—all being within the city limits. A three-track steel bridge of the Monongahela Connecting Railroad crosses the river within the works. This is controlled by Jones & Laughlins, Limited. One track is used exclusively in transferring molten metal from the



General View of Blast Furnace.

THE ELIZA FURNACES, JONES & LAUGHLINS, LIMITED, PITTSBURGH.

and billets, beams, channels and other structural shapes, rails and fish plates, hoops and bands, light sheets to heavy plates, merchant bar, chains, bolts, rivets, railroad spikes, car links and pins, cold rolled shafting, cold rolled squares, rounds, angles and special shapes, pillow blocks, hangers, pulleys, couplings of various kinds, &c. Their principal rolling mills, Bessemer and open hearth plants, foundries, factories and structural and

furnaces to the Bessemer and open hearth works. The river at this point is over 900 feet wide. The bridge is 1090 feet long, the longest span being 325 feet centers of piers.

The Eliza Furnace Department consists of four modern blast furnaces of the largest size and the necessary accompaniments. These furnaces are situated on the right bank of the Monongahela River; the property hav-

ing a frontage on the river of over 6000 feet and railroad connections with the Baltimore & Ohio, Pittsburgh & Western, and through the Monongahela Connecting Railroad with the Pittsburgh & Lake Erie and Pennsylvania system.

Beginning our description with the raw materials

the river mines they have three powerful steamboats. The company also own over 130 coal barges; the larger part of them having a capacity of 550 tons each. The coal fleet has to supply their extensive South Side works as well as the Eliza and Soho furnaces and coke works. The shipment of coal by river to all departments aver-

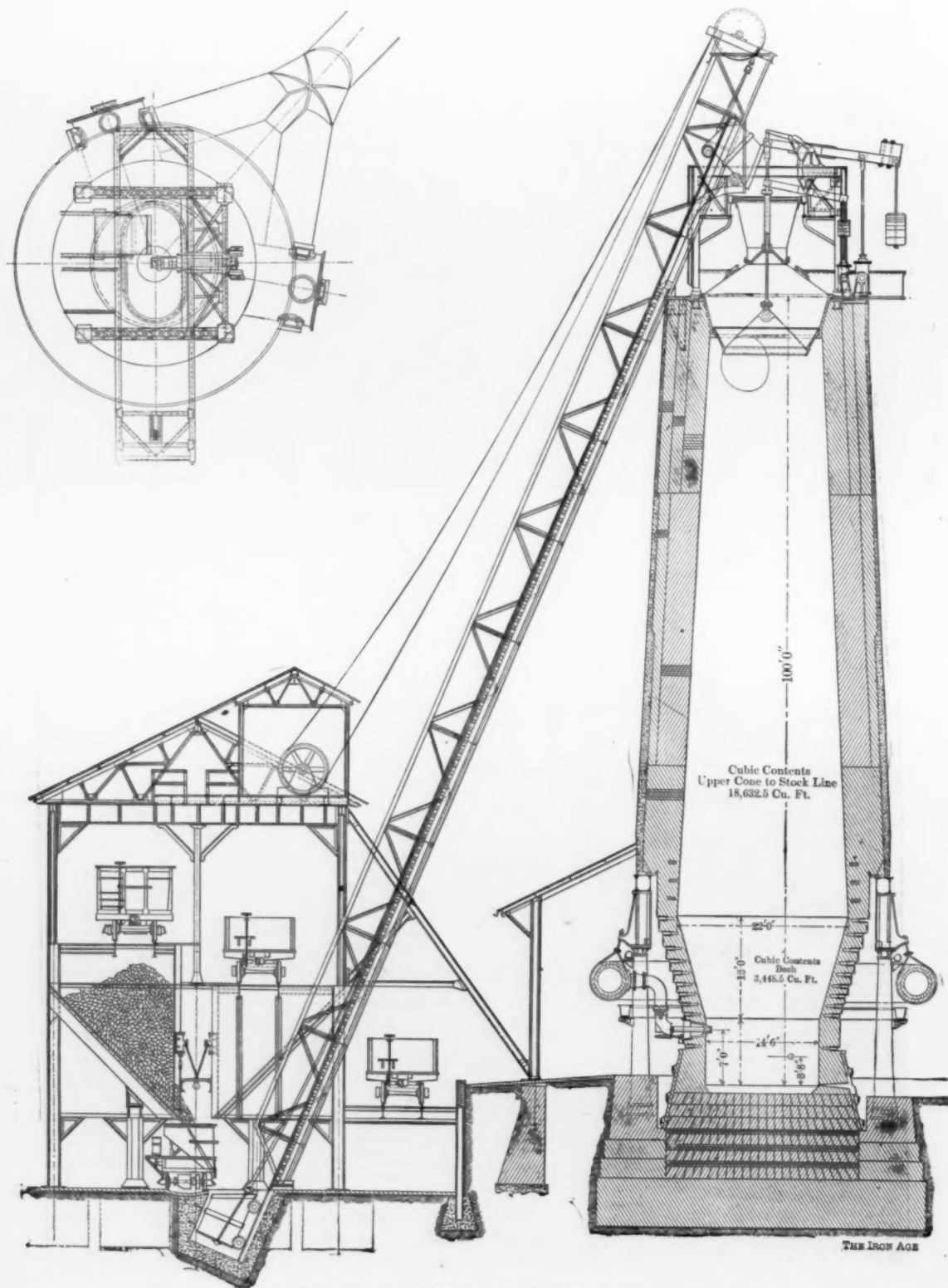


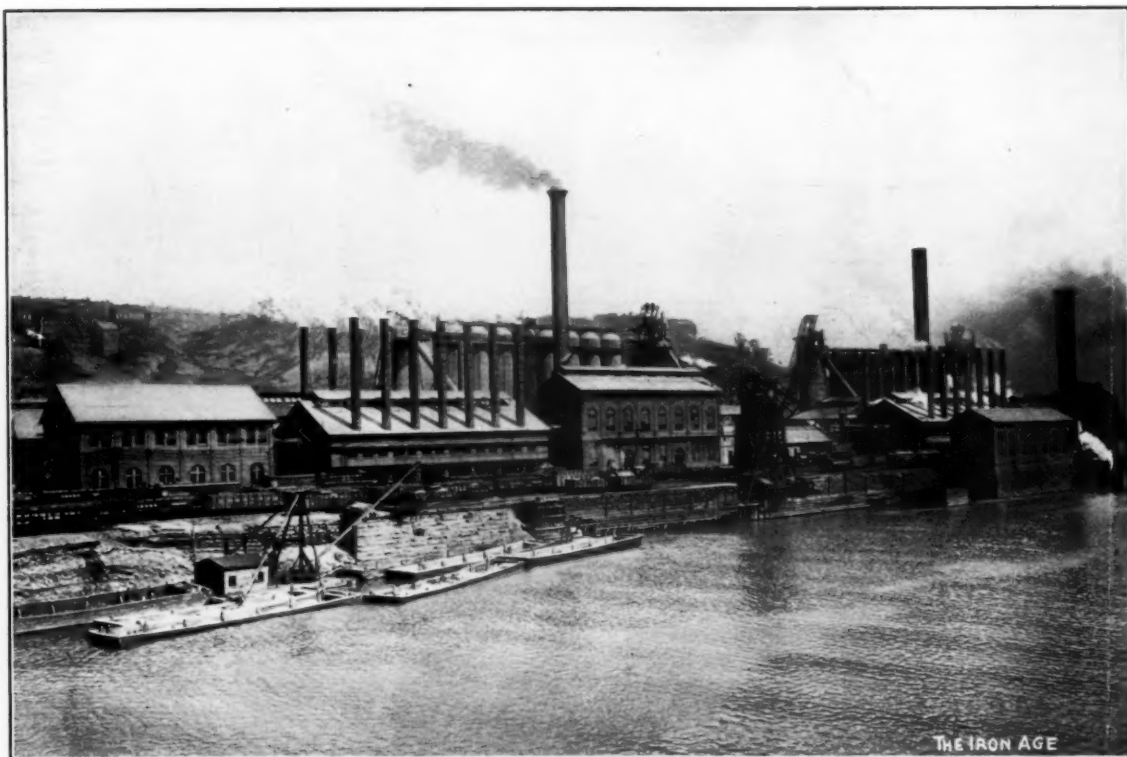
Fig. 1.—Side Elevation and Section of Stack.

THE ELIZA FURNACES, JONES & LAUGHLINS, LIMITED, PITTSBURGH.

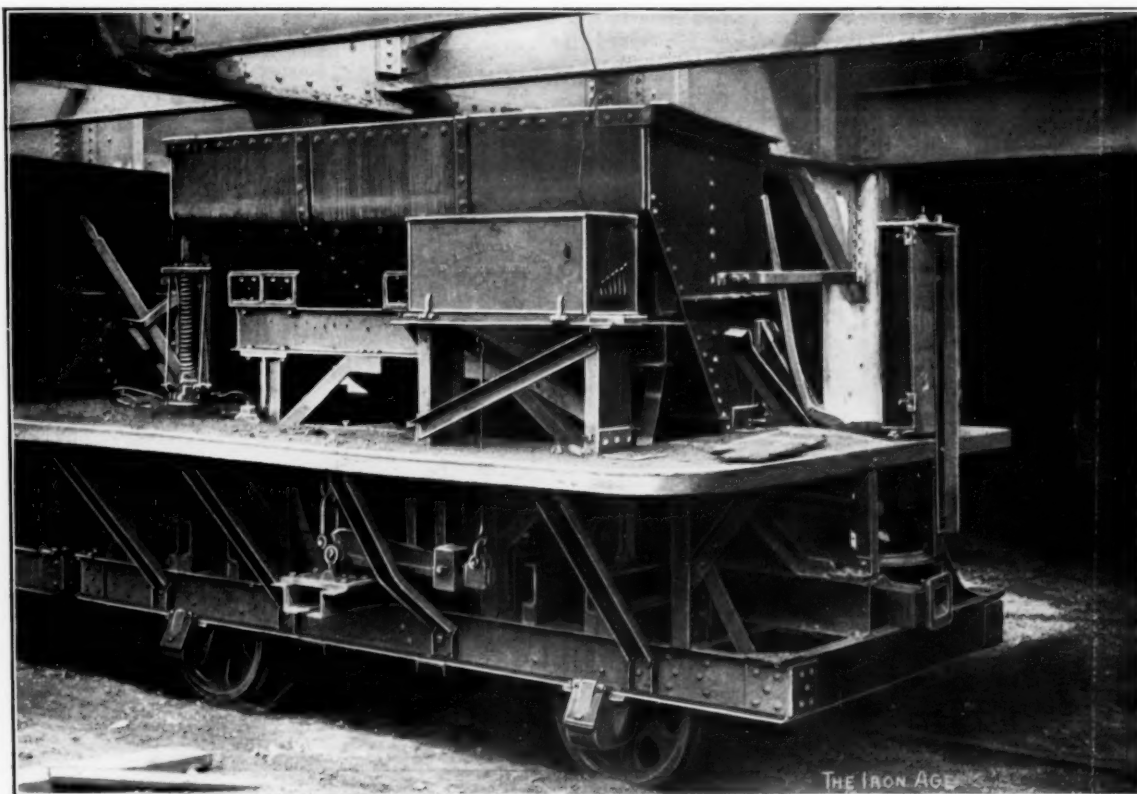
used in iron making, we note that the company own their own ore mines in the Lake Superior and Mesaba regions, extensive coal lands in the Fourth and Fifth Pools of the Monongahela River, and limestone quarries in Blair County, Pa. For the transportation of the ore the company use their own pressed steel hopper cars of the most approved design. To bring their coal from

ages about 125,000 tons per month. Coal is also received by rail.

On the Eliza Furnace property there are in continual service 1386 beehive coke ovens, with the most modern appliances for the handling of the coal and coke. They have also in constant use 200 coke cars for the handling of their stock in the yards.

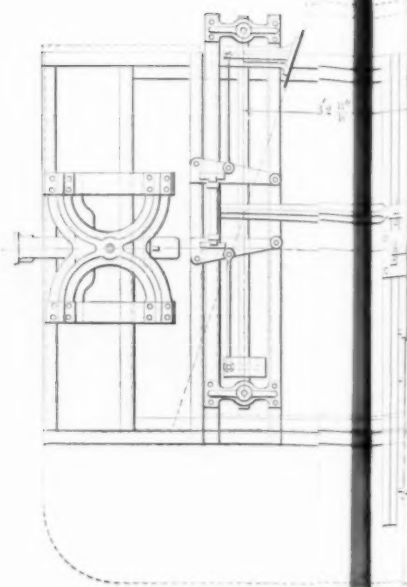
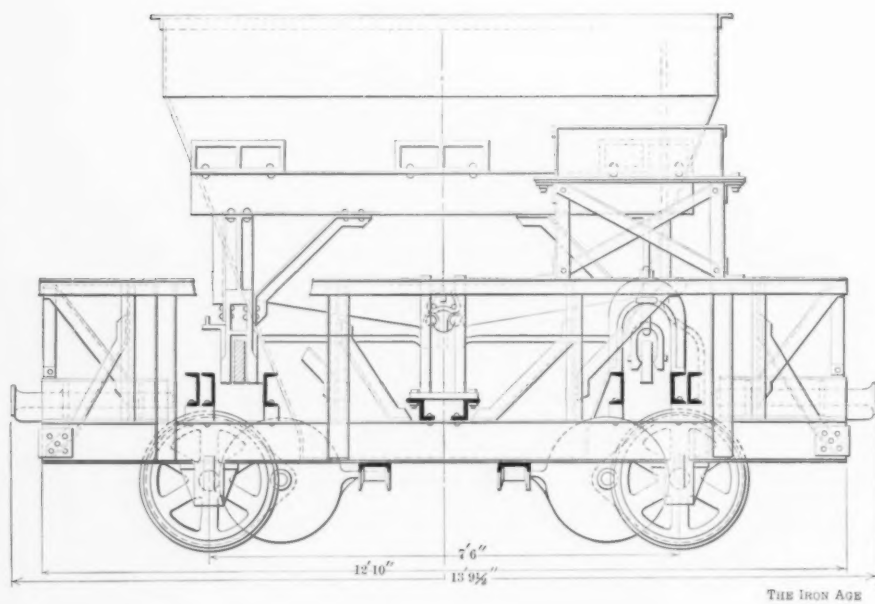


VIEW OF PLANT FROM THE MONONGAHELA RIVER



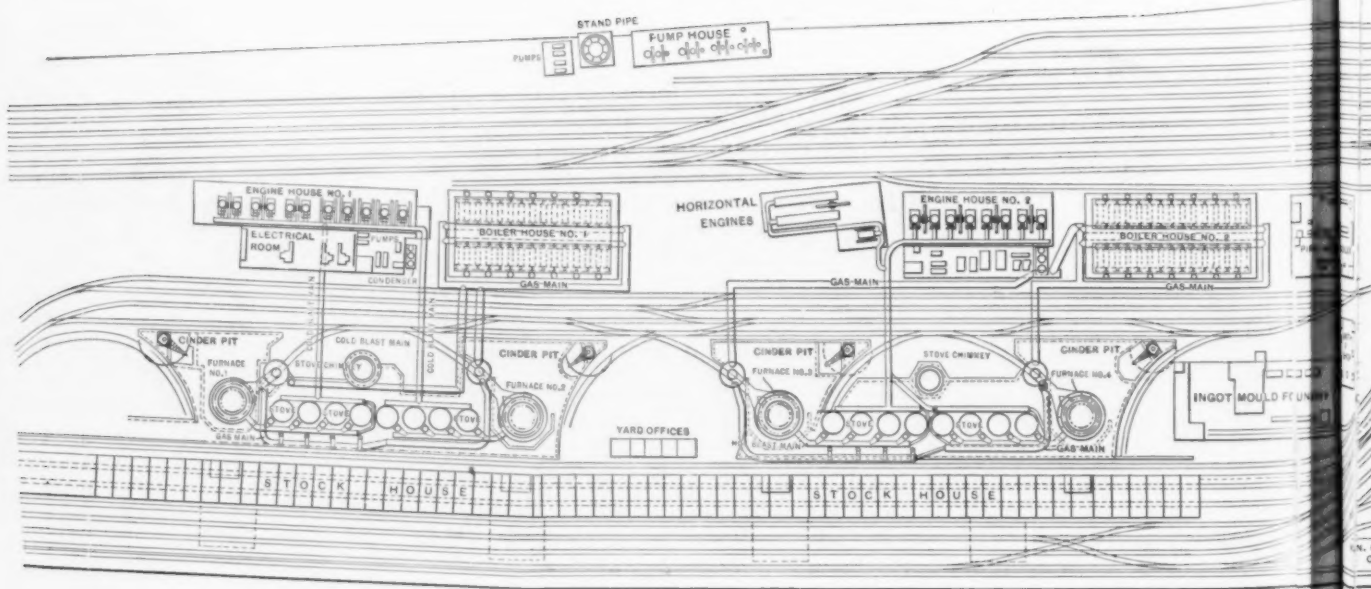
THE STOCK LARRY.

THE ELIZA FURNACES, JONES & LAUGHLINS, LIMITED,
PITTSBURGH, PA.



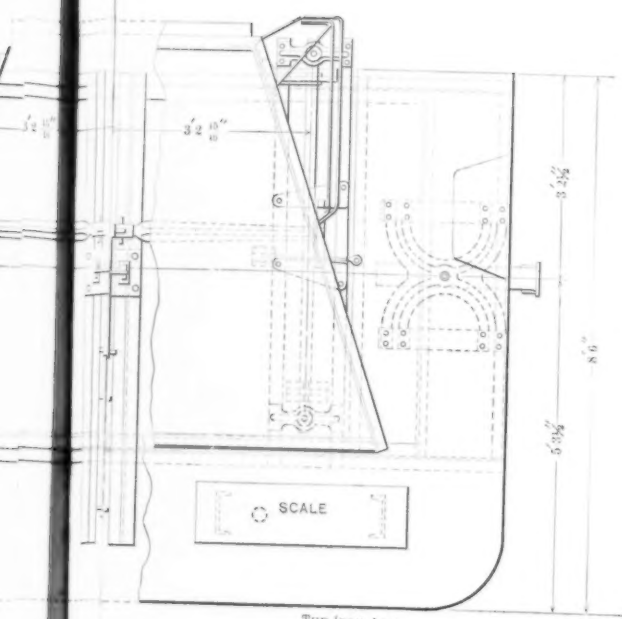
SIDE ELEVATION, END ELEVATION, AND

M O N O N G A H E L



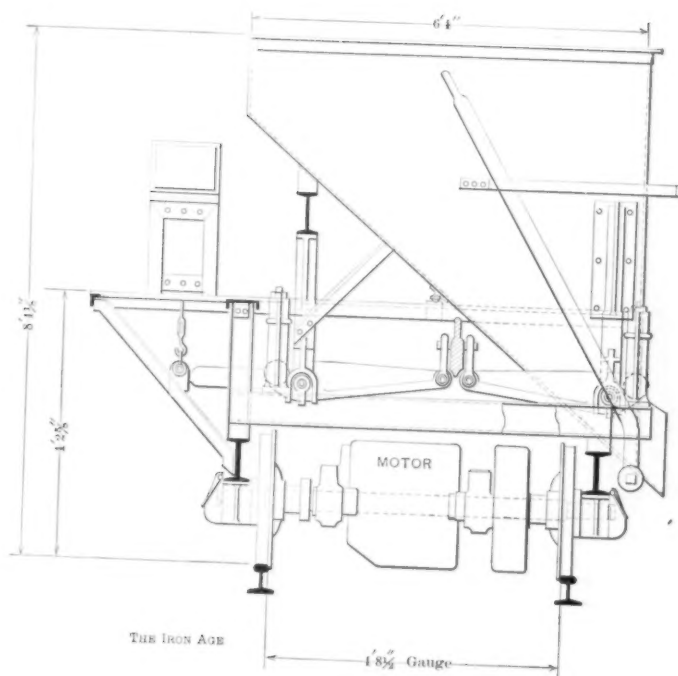
GENERAL PLAN

THE ELIZA BLAST FURNACE PLANT, JONES L



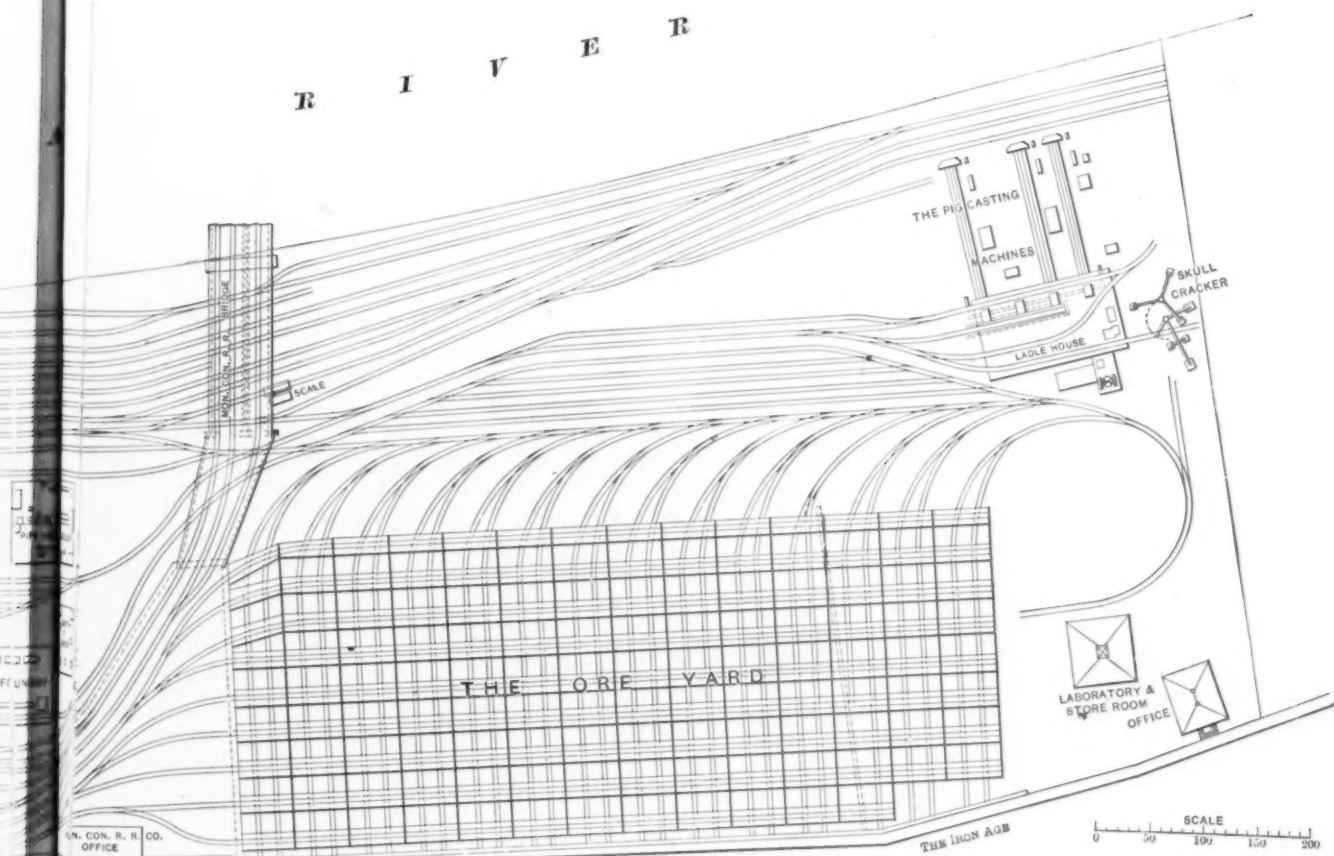
THE IRON AGE

ELEVATION AND PLAN OF STOCK LARRY.



THE IRON AGE

R I V E R



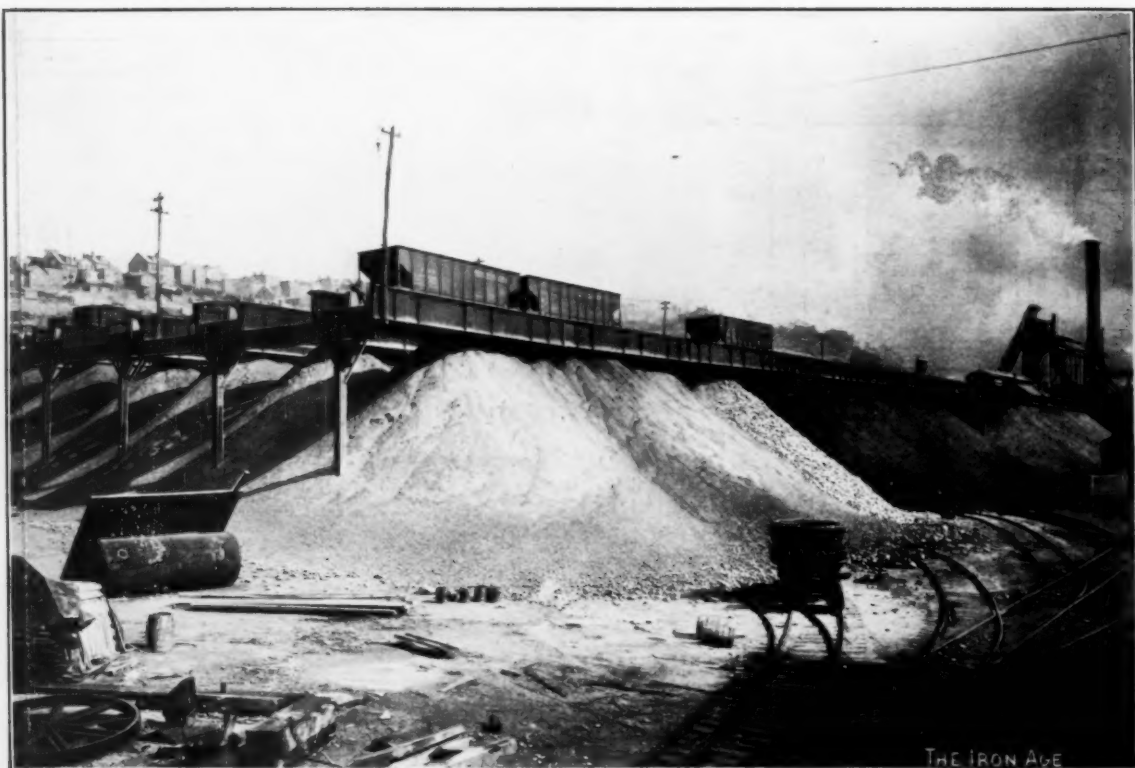
UN. CON. R. R. CO. OFFICE

THE IRON AGE

LABORATORY & STORE ROOM OFFICE

PLAN OF WORKS.

LAUGHLINS, LIMITED, PITTSBURGH, PA.



THE ORE YARD.



THE HOT METAL LADLES.

THE ELIZA FURNACES, JONES & LAUGHLINS, LIMITED,
PITTSBURGH, PA.

The Ore Yard.

Beside the ore bin system, which is in constant service, it is necessary to have a storage for the winter's supply; as well as for the intermittent shipments that are inseparable from railroad service. For these conditions an ore yard is provided, which has a capacity of 550,000 tons of ore. The surface covered is about 750 x 330 feet. Over this nine tracks 700 feet long are carried on steel columns about 40 feet above the surface of the yard. This height is reached by the same grade that leads to the Monongahela Connecting Railroad bridge. From the hopper bottom cars the ore is dropped with the minimum of labor. On the ground level and at right angles to the elevated tracks are laid standard gauge tracks

inch steel plate, and the floor of maple plank, on a backing of 4-inch oak plank. As shown in Fig. 1, there rise from the outer row of columns of the bins the posts of the stock house, a steel building which covers the entire bin system. The hoist engine houses are located above the chords of the stock house, leaving clear head room for the locomotives handling the stock cars. The surface under roof is about 1110 x 40 feet. The bin doors are of the guillotine type, worked by direct action of a vertical air cylinder placed immediately above. Doors of both rows of bins face each other and open above a ground track running the entire length of the stock house.

On this track are placed eight larry cars, two to each

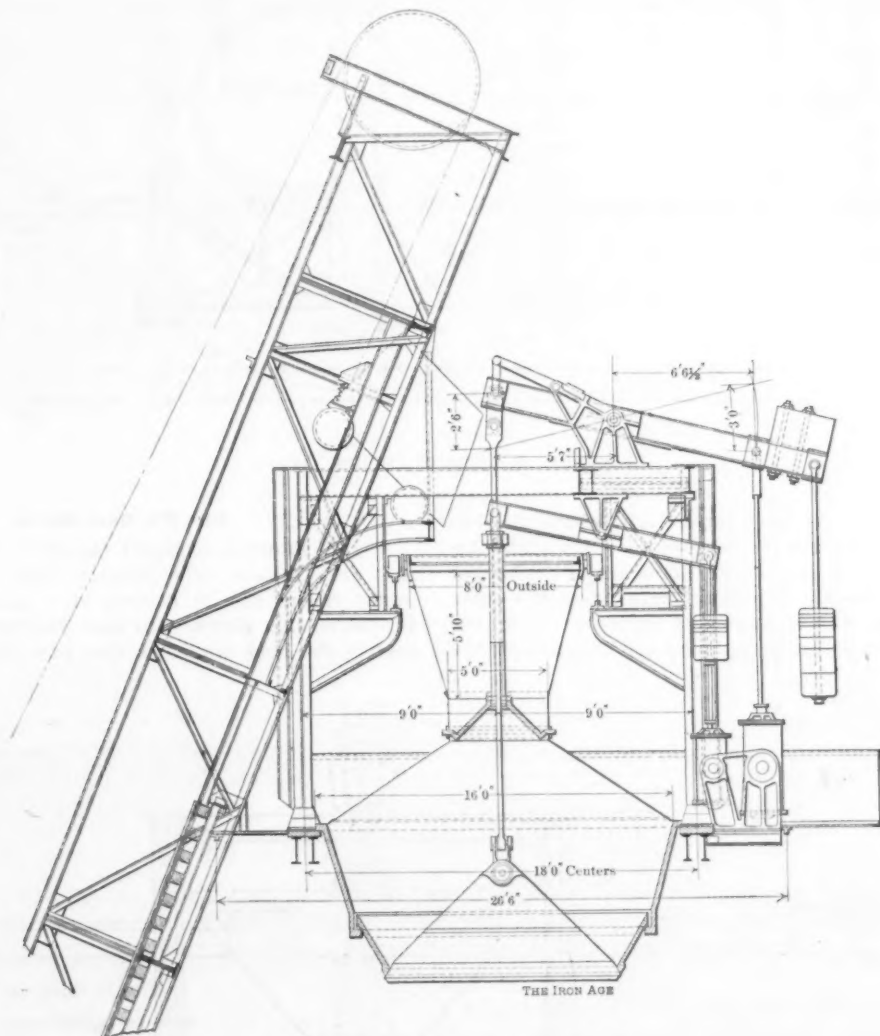


Fig. 2.—Elevation of Furnace Top.

THE ELIZA FURNACES, JONES & LAUGHLINS, LIMITED, PITTSBURGH.

25 feet apart, the arrangement being shown in the plan printed as a part of our supplement. On these run a number of locomotive steam shovels, product of the Industrial Iron Works of Bay City, Mich. Behind, or on either side, are placed standard hopper cars, which are loaded at an average rate of three or four per hour—a 100,000-pound car has been loaded in 12 minutes. These cars are then run to the bins. During the entire season of ore shipments the bins are kept full, and the surplus ore only goes to the ore yard. The coke is brought directly from the ovens to the bins as required. An emergency coke pile of large dimensions is also kept on hand.

The Bin System

Two rows of bins are placed in stock house, as shown in the plan. There are 128 bins in all. Each bin is about 16 feet square at top. The bottom slopes at about 45 degrees. The lower bins are used for ore, and the higher one for coke and limestone. The frame work of the bins is of massive structural steel, the sides of $\frac{1}{2}$ -

furnace. These receive the ore, coke, limestone, &c., from the bins and convey the charges to the skip cars or buckets, which, in turn, carry them to the top of the furnaces. The larry cars, a general view and drawings of which are presented on the supplement, consist of a truck with electric motors, and a hopper shaped body which is balanced on a multiple lever scale. One larry, either of the two, supplies coke; the other receives the different kinds of ore, weighing each kind as it falls into the hopper. Ordinarily, one larry works on the right and the other to the left of the skip, meeting alternate buckets so as to avoid waiting for each other. There are also three turntables and storage tracks for spare larrys. Skip buckets are 5 feet square inside in cross section. Two are used on each skip, counterbalancing each other. The angle of skip is about 67 degrees from the horizontal. On two of the furnaces the skips are worked by electric motors of 150 horse-power; the other two have Otis-Crane hoisting engines with 14 x 16 inch

cylinders. All the winding drums are 72 inches in diameter.

The Furnace Top.

An automatic charging apparatus is used at the tunnel head, the details being illustrated in Figs. 2, 3 and 4. The skip buckets run on four wheels, the hind pair hav-

worked independently by steam cylinders, which are controlled by the engineer in the hoist engine house. The upper hopper, Fig. 4, is mounted on wheels, for quick removal in case of repairs. A spring buffer is provided for the hind pair of the bucket wheels at the highest point of the run.

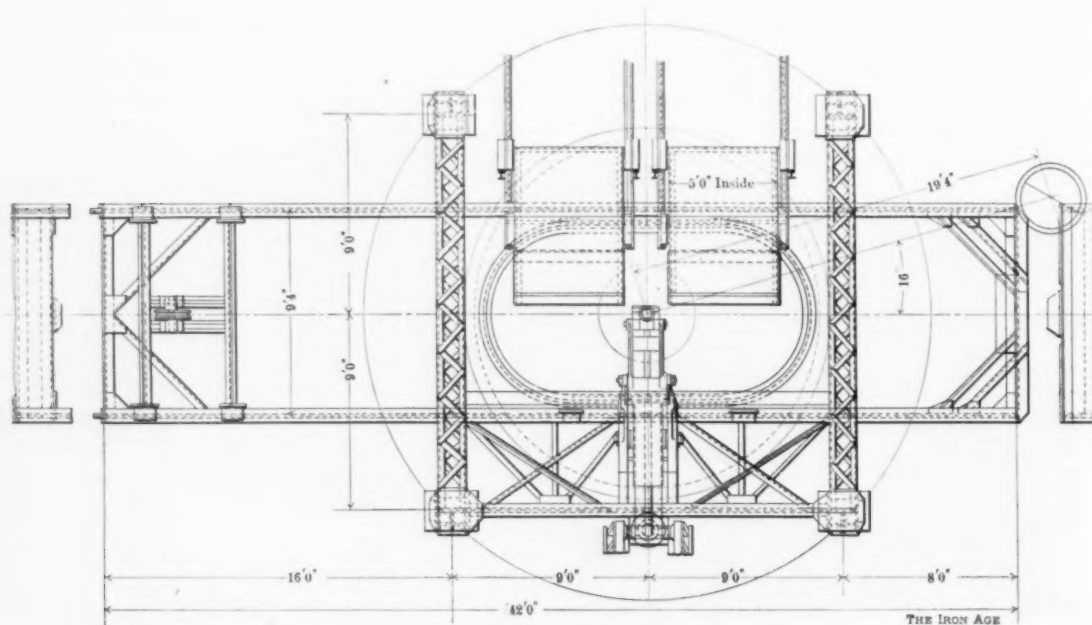


Fig. 3.—Plan of Furnace Top.

ing double treads. At the proper height above the top platform the track rails are curved to a horizontal toward the furnace, so as to carry the mouth of the bucket over the upper hopper. Auxiliary rails catch the outer tread of the hind wheels and carry them further up the incline, thus automatically dumping the charge into the

The Furnace Stack.

Fig. 1 shows a sectional elevation through the bins, skip and furnace. The furnace shell rests on ten columns. There are 20 tuyeres of 6 inches in diameter. Bronze cooling plates with cast iron boxes, in ten rows, protect the bosh walls. A cast iron hearth jacket, wa-

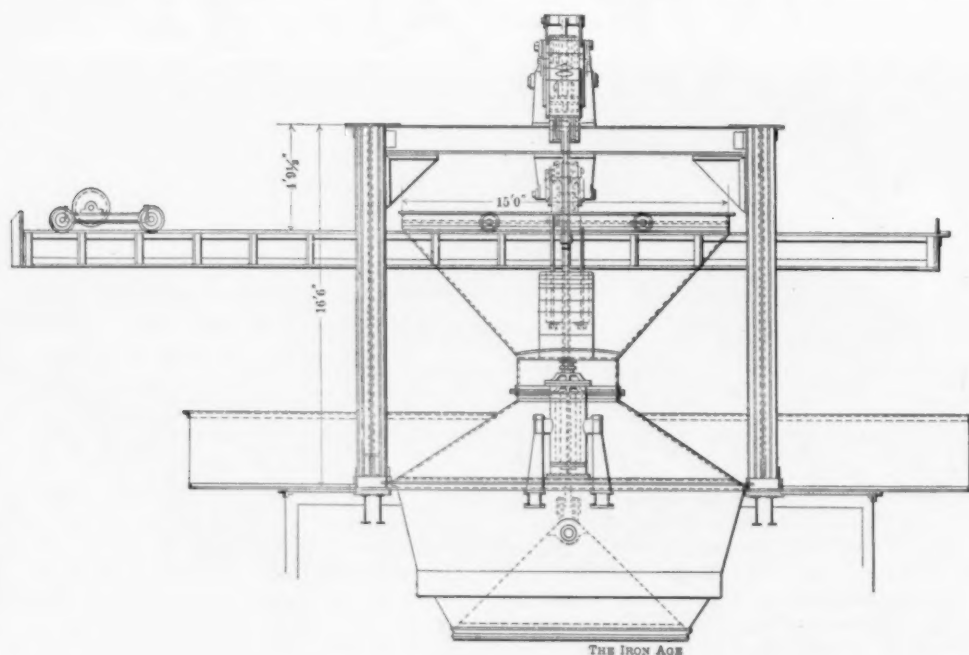


Fig. 4.—Elevation of Furnace Top.

THE ELIZA FURNACES, JONES & LAUGHLINS, LIMITED, PITTSBURGH.

hopper below. This hopper is oblong, extending in front of both buckets, Fig. 3. Its center is located over the center of the furnace. Its lower end is closed by a small bell, Fig. 2. The hopper rests on a hood, which, in turn, rests upon the ordinary large furnace hopper; the hood forming a seal for the gases when the large bell is lowered to admit the charge to the furnace. Both bells are

ter cooled, surrounds the well. The principal dimensions are given on the drawing. Two gas outlets leave the top of the furnace at 116 degrees apart. These are elliptical in cross section, and extend horizontally in a radial line from the shell. Each carries three explosion doors 34 inches in diameter; one on the outer end and one on each side; there being, therefore, six doors to each furnace.

From the under side of each of these outlets a downcomer 73 inches in diameter starts downward at an angle with vertical line of furnace of about 35 degrees 40 minutes, meeting each other about 40 feet below, and forming one main downcomer of 98 inches in diameter of shell, which conveys the gases into the top of the dust catcher. The latter is 21 feet in diameter with a center flue inlet, a side outlet for gas and a bell and hopper dust outlet. The foundations of the dust catchers are made of such form and dimensions that a standard steel hopper car can be run under the bell and the flue dust be dropped directly into it. The gas flues to the stoves and the boilers are also provided with dust pockets, depending from the under side at convenient distances apart. These pockets are about 3 feet in diameter, and have bell and hopper bottoms, from which

cranes are 15 inches in diameter by 7 feet 6 inch stroke. Their action is smooth, with a quick return of the ladle. Two pairs of Wilson-Snyder duplex hydraulic pumps, 14 x 15 x 18 inches, furnish power for the cranes.

The Hot Metal Cars.

This car is somewhat unique in its simplicity and in its adaptation to its work. The design is shown in detail in Fig. 5. There are but four castings in the car body besides the journal boxes and draw heads. The sides are in one piece and are duplicates of one pattern. The ends are alike, excepting that they are right and left. The connecting surfaces between the ends and sides are large, and being flanged and machine finished, are permanently rigid and square. The couplers, the wheels, axles, journal boxes and fittings are all Master Car Builders' standard. The trunnions are placed 24 inches forward of the center of the ladles. About the same distance back are attached two brackets, which also rest with the trunnions on the end pieces of the car. The ladle is thus supported at four points well apart, so that there is perfectly safety from rocking or tipping the ladle on the car. The forward position of the trunnion also produces a very short radius of arc traveled by the nose of the ladle in tipping; thus pouring the metal nearly in one spot in the runner, without splashing. This is a decided gain, as the metal has to fall about 6 feet at the beginning of the flow.

A ladle house, 74 x 130 feet, containing a 30-ton Mor-

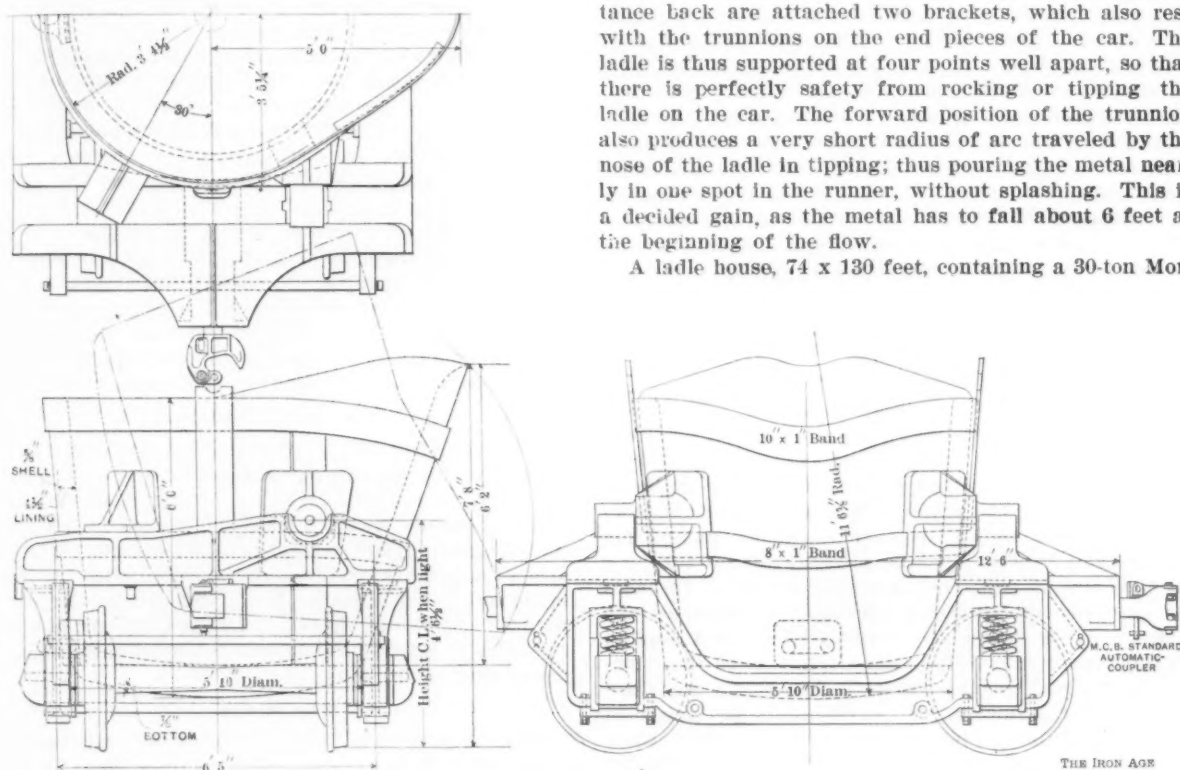


Fig. 5.—The Hot Metal Car.

THE ELIZA FURNACES, JONES & LAUGHLINS, LIMITED, PITTSBURGH.

hang hinged spouts that can be swung over a car so that the dust is loaded without handling.

Hot Blast Stoves.

There are four stoves to each furnace, of the Cowper-Kennedy type. The shells are 22 feet in diameter by 108 feet high to the top of the dome. They are supplied with cleaning and air doors, Spearman gas valves and improved hot blast valves. Gas, air and cleaning doors have renewable seats, and are as far as possible interchangeable in their parts. One stove chimney, about 12 feet in diameter inside of lining, and 220 feet high above the foundations, is provided for eight stoves. Harbison & Walker fire brick are used in linings of furnaces and stoves.

The Hot Metal.

As will be seen in the general plan, no casting beds are provided. The entire cast is run out under a skimmer in cast iron runners into the hot metal ladles. Each ladle, holding 20 tons, is lined with fire brick, and is mounted on a four-wheeled car. Each furnace is tapped every four hours. All the molten metal required at the South Side works is sent by the way of the bridge and poured direct into the mixer at the Bessemer works. The Sunday output is sent to the pig machines. There are three of these, each capable of handling 1000 tons of molten metal in 24 hours. The ladles are tipped by hydraulic cranes, one being stationed at each machine. The

gan electric traveling crane of 72 feet span, is located near the pig machine.

The skull cracker is of structural steel; and is a tripod 75 feet high to center of top sheave. A 6000-pound ball can be dropped nearly 70 feet. A steel derrick capable of lifting the largest skull swings from a track to the center of the drop.

The Cinder Problem.

How to get rid of the cinder is a question that is worrying the owners of blast furnaces in the thickly settled districts where there are no longer low lands to fill up. At the Eliza plant each furnace is provided with a cinder pit about 20 x 30 x 24 feet deep. About 10 feet of water is kept in the pit, and into this the cinder is topped together with a flat stream of water. It is at once granulated and cooled, and can be lifted out as soon as the flush is over. A steel McMyler turntable crane, with clam shell bucket, holding 1½ cubic yards, is located alongside of the pit and within reach of a track. A number of Weimer cinder cars are also in service for filling around the works.

The Boilers.

Fifty-six Laughlin water tube boilers furnish steam for the furnace plant and shops, not including the coke plant. The boiler heads are 9 feet in diameter, and are united by 194 tubes 2½ inches in diameter by 18 feet long. These boilers are rated at 350 horse-power each.

They are, of course, fired with the waste furnace gases. Provision is also made for coal firing. There are two boiler houses, each containing 28 boilers. The boilers are placed in a row, 10 feet center to center, heads of the two rows 16 feet 9 inches apart in clear. They are fired from the inner ends, between rows, having one gas leg with two burners to each boiler. The coal supply is deposited automatically when used at a convenient place in front of boilers from an overhead Heyl & Patterson conveyor, which lifts it from the cars and distributes it to the boilers. Each pair of boilers has a chimney 66 inches in diameter by 100 feet in height. The steam pressure carried on the boilers is 140 pounds. All steam pipes are covered with H. L. Childs & Co.'s magnesia, asbestos and sheet iron covering.

The Blowing Engines.

There are several types of engines in service. The list is as follows: One pair of Allis horizontal engines, 42 x 84 x 72 inches; with a displacement of 923.6 cubic feet per revolution; one Southwark vertical engine, 42 x 84 x 60 inches, with a displacement of 384.8 cubic feet per revolution; four Allis vertical engines, 40 x 79 x 60 inches, with a displacement of 314.0 cubic feet per revolution; one Allis vertical engine, 42 x 79 x 60 inches, with a displacement of 314.0 cubic feet per revolution, and seven pairs of Allis vertical cross compound engines, 42 and 80 inches steam; 87 and 87 inches air, by 60-inch stroke, with a displacement of 772.8 cubic feet per revolution. All excepting the first two have Kennedy inlet valves 22 inches in diameter and Reynold's automatic outlet valves on the air cylinders.

Feed Water Heaters and Condensers.

Four 4000 horse-power Cochrane heaters and purifiers are in service with the necessary complements of feed pumps to supply the boilers. The exhaust steam from the pumps and air compressors is utilized in the heaters. The feed pumps are Worthington, and also Wilson-Snyder duplex tandem compound. Extra pumps for washing out boilers and high pressure pumps for forcing mud out of tuyeres and cooling plates at furnaces are provided. A weighted accumulator regulates the pressure in the boiler feed system. Two Worthington jet condensers receive the exhaust steam for the blowing engines and dynamo engines. The steam inlets are 36 inches in diameter, the water inlets 16 inches in diameter and the tail pipes 18 inches in diameter. Each one is guaranteed to condense at the rate of 130,000 pounds of steam per hour. Centrifugal water pumps and air pumps assist the jet, and keep up a constant and high rate of efficiency.

The Water Works.

The pump house for the water supply is located on the bank of the Monongahela River, one side being exposed to the river. The foundation rests on piles driven down to about 54 feet below yard level, and 32 feet below low water mark. The piles were sawed off at a level of 20 feet below low water. On top of the piles rest six courses of 12 x 12 inch timber and a double floor, forming the bottom of the caisson in which the masonry is built. The outer walls are of heavy stone, dressed to a uniform thickness. The wells are of brick work, lined inside with vitrified brick, the space between the wells and the outer masonry being filled with concrete. About 26 feet of masonry, &c., is built up from the timbers below to the top of the wells and the base of the pumps. The floor of the pump house is 13 feet higher. The dimensions of the house above the floor are 124 feet long by 31 feet wide inside of walls. On the side nearest the river are built in eight wells; each 11 feet long, 8 feet wide and 26 feet deep. About 10 feet below low water intake pipes 30 inches in diameter connect the wells with the river. Each well has its own intake and sluice gate. The wells also communicate through 30-inch pipes in their walls with sluice gates. This arrangement makes it possible to clean out any one of the wells without interfering with the others. In the wells are placed, in frames, double screens of No. 11 galvanized iron wire, 1/4-inch mesh. The screens can conveniently be hoisted out and cleaned.

In the pump house are placed two 6,000,000-gallon

and two 12,000,000-gallon triple expansion high duty pumping engines, of the crank and fly wheel style. They were built by the Wilson-Snyder Mfg. Company of Pittsburgh. The 6,000,000-gallon engines have 14-inch high pressure steam cylinders, 22-inch intermediate and 36-inch low pressure steam cylinders; 20-inch plungers; all 30-inch stroke. At 34 revolutions per minute, or 170 feet piston speed, each pump delivers 6,000,000 gallons in 24 hours. The 12,000,000-gallon engines have 21-inch high pressure steam cylinders, 36-inch intermediate and 56-inch low pressure steam cylinders; 26-inch plungers; all 36-inch stroke. At 34 revolutions per minute, or 205 feet piston speed, each pump delivers 12,000,000 gallons in 24 hours. All the pumping engines are of similar design. The plungers are single acting, outside packed. The valve gear is of the Corliss type, with valves located in the cylinder heads. The engines are self sustained, supported by the valve chambers and heavy cast iron columns.

The condenser is of the jet variety, drawing its own supply from the wells, and discharging into the river. The galleries of the engines are connected together, and two spiral stairways are provided. Each pump has two discharge nozzles. A discharge main extends on each side of the pumps, so that either pump can be cut out, and either main laid off for repairs, &c. The four pumping engines discharge into a stand pipe, which is 14 feet inside diameter and 135 feet high. It stands at one end of the pump house, on the river bank, and has foundations similar to those of the pump house. Its massive base of masonry and concrete stands 4 feet above high water. Distributing pipes with cross overs and cut outs lead to all parts of the works.

The Electric Plant.

The electrical plant consists of three Westinghouse 200-kw. direct current, 220-volt generators, each directly connected to a Dick & Church tandem compound condensing engine, with cylinders 14 and 25 inches by 18 inches, making 200 revolutions per minute. There is also an eight-panel switchboard equipped with the Westinghouse system. Beside the motors in service in all parts of the works, there are 150 inclosed arc lamps of 220 volts, and 1500 incandescent lamps of various candle power and of 110 volts.

The Shops.

The machine shop building is of structural work and brick, 100 x 75 feet inside, and 2 1/2 stories high. The lower floor is partitioned, having on one side the machine shop tools, and on the other the boiler and pipe fitting shops. Up stairs are the carpenter's and pattern maker's shops, tool room, sheet iron and tin shop and rigger's room. The loft contains the paint shop and storage for patterns and pattern lumber. The blacksmith shop is a steel building, 60 x 54 feet.

A mold foundry, 160 x 70 feet, of structural work and brick, is used mainly in casting molds for the Bessemer and open hearth works of the South Side. Molten metal taken directly from the furnaces in the hot metal cars is used; the pouring and handling of ladles, flasks, molds, &c., being done by a 25-ton Morgan traveling crane, which covers the entire floor of the foundry.

Core ovens with large removable steel cover doors are placed beneath the floor level, thus permitting of the utilization of the entire floor space.

In the yard a 10-ton locomotive crane, built by the Bay City Industrial Works, has proved to be a very profitable tool in the unloading and handling of machinery, castings, &c.

The locomotive service is performed by the Monongahela Connecting Railroad Company, who also take care of all tracks and keep all standard cars in repair.

A handsome two-story office building in Pompeian brick, containing 11 rooms and all modern conveniences, and a two-story storeroom and thoroughly equipped laboratory are located at the main entrance to the works.

F. C. Roberts & Co. of Philadelphia were the consulting engineers in the construction of the plant.

The principal officers of the Eliza Furnace Department are as follows:

Eugene L. Messler, general superintendent.

P. H. Gilday, assistant general superintendent.

Wm. I. Mann, chief engineer.
 Wm. Smith, master mechanic.
 Thomas L. Owen, chief clerk.
 N. C. Neems, superintendent of coke department.
 E. P. Douglass, superintendent of general labor.
 Z. Webb, chief chemist.
 John Hutchinson, superintendent of mold foundry.
 Robert Turner, chief electrician.

Ore Headquarters in Duluth.

Western headquarters for the offices of the United States Steel Corporation's mining and transportation interests will be in a building now under way at Duluth and to be completed some time next year. The foundations are in and steel for the superstructure is expected about January 1. In this building will be all the Lake Superior mining offices of the corporation, together with their railway and steamship organizations. The building will occupy a site 100 x 140 feet on the corner of Third avenue West and First street, Duluth, and will be seven stories high. The scheme of architecture is renaissance, the first two stories of redstone, the super-

sign of the whole—stairways, &c.—will follow in a general way the grand stairways and entrance of the Chicago Public Library, one of the most beautiful entrances in America.

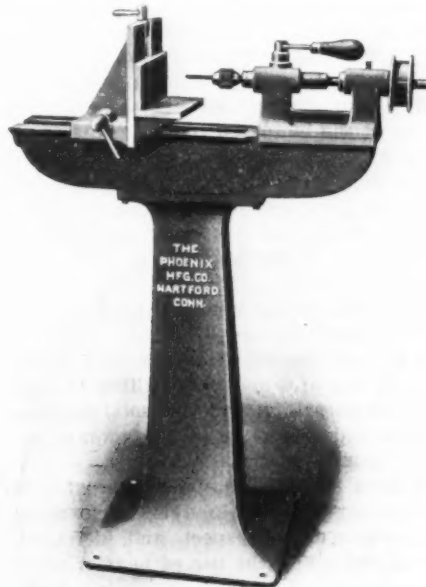
This building has been leased for a long term of years from the Wolvin Building Company, composed largely of managers of concerns subsidiary to the United States Steel Corporation. It is called the Wolvin because A. B. Wolvin, vice-president and general manager of the company's vast lake transportation interests, had much to do with the plan and erection. Most of the contracts for construction, excepting mill work, plumbing and heating, have been let. The architects are the Duluth firm of Palmer, Hall & Hunt, who have designed some notable and successful buildings both in Duluth and elsewhere.

The Phoenix Combined Centering Machine and Drill.

The Phoenix Mfg. Company of Hartford, Conn., are manufacturing a new combined centering machine and



Centering Machine.



Drill.

THE PHOENIX COMBINED CENTERING MACHINE AND DRILL.

posed four a plain shaft of gray brick and the attic, or capital, of terra cotta and brick, with a wide terra cotta cornice. The ornamentation of the building is massed in the capitol. Above the second floor the shape of the building will be an L, the inner rear corner being left as a wide light shaft, so that every room in the entire building has abundance of direct outside light. Every window is rectangular, thus aiding the purely office character of the building.

There will be 12 offices upon each floor, one of them a general work room for some department 45 x 60 feet and with light upon three sides. The remaining offices are also large, averaging more than 500 feet of floor space each. On the ground floor the rear inner corner of the building is utilized as general vault, 40 feet square, main toilet room, bicycle room and barber shop. Above this the space is uninclosed. There will be three elevators, placed well to the front of the building and in prominent view, and the main entrance lobby is 22 feet wide. A side entrance from the avenue also leads to the elevators. There will be toilet rooms on each floor and a tier of vaults in all the larger offices.

The main architectural feature of the interior will be the main entrance and stairway from the first floor. This will be finished throughout in selected Italian marble, with panelings relieved by glass mosaic. The de-

drill. The spindle carries a combination drill and reamer, and one movement of the lever finishes the operation. The vise jaws have long bearings and hold equally well round, square, hexagonal or octagonal work from $\frac{1}{8}$ to 4 inches in diameter. For using the machine as a traverse drill there is provided a small knee with adjustable bracket, which is secured to the bed in place of the vise and rest, as shown in the second engraving. This machine is made under the direct supervision of Geo. Q. Whitney, formerly of the Pratt & Whitney Company.

Eastern Tube Company.—The new plant of the Eastern Tube Company, at Zanesville, Ohio, is practically completed and is in operation. This concern are prepared to turn out tubes from $\frac{1}{4}$ to 16 inches in diameter. Their plant is a large one and has modern equipment throughout. The general offices of the concern are in the Pittsburgh Bank for Savings Building, in Pittsburgh, with C. E. Corbett, general manager, in charge. The officials of the company are: F. A. Beall, president; E. C. Card, treasurer, and Joseph H. Beall, secretary.

The third blast furnace of the Dominion Iron & Steel Company at Sydney, C. B., has been blown in.

The Bureau of Ordnance.

The Report of Admiral O'Neill.

WASHINGTON, D. C., October 29, 1901.—Admiral O'Neill, Chief of the Bureau of Ordnance, has transmitted his annual report to the Secretary of the Navy, through whose courtesy the correspondent of *The Iron Age* is enabled to present the advance abstract given below. The features of the report embrace the conclusion reached by the Bureau during the past year that the maximum desirable caliber of high power guns has been reached, and that efforts should now be concentrated upon increasing the weight of the projectiles and the ballistic efficiency of powder; important modifications in the designing of armor; the development of the manufacture of smokeless powder by the Government, together with its relation to private enterprise; the conclusion that the submarine torpedo boat is still in an experimental stage, &c.

"The operations of the Bureau during the past year," says Admiral O'Neill, "have chiefly been those of preparing the armament and ordnance outfits for new vessels; maintaining vessels in commission; overhauling and refitting for service the batteries, &c., of vessels in ordinary, and improving the condition and facilities of the Ordnance Department at the several navy yards and stations to meet the increased requirements of the navy, so far as funds at the disposal of the Bureau would permit.

"No important developments in armor or naval ordnance have taken place during the past year. Improvements have been made, however, in the details of gun mechanisms, in sights, and in mountings and equipments.

"No material change has been made in the system of gun construction followed by the Bureau for a number of years, except that provision has been made for future guns of and above 6 inches in caliber for an inner and outer tube or barrel, instead of a solid forging as heretofore used, in order to increase the factor of safety of the chase and muzzle of the gun.

"The latest types of guns are so great in weight and dimensions that it seems inadvisable to make any further increase in either respect, and increased efficiency must be looked for in the use of heavier projectiles and in the production of powder possessing higher ballistic properties. The Bureau has already taken the initial steps to introduce the former, and hopes to be able to develop the latter.

"In arranging the armor plans for ships a considerable reduction in the number of butts has been made on the suggestion of the Bureau, and the use of small plates about port holes and sponsons has been materially reduced.

"The use of torpedoes on large vessels has practically been discontinued, no provision having been made for them in the latest battle ships and cruisers.

"The general performance of guns, mounts, ammunition and ordnance equipments is reported from ships in commission as being satisfactory, except as hereinafter noted, and it is believed that the ordnance equipment of United States naval vessels is fully up to the highest standard maintained abroad for vessels of corresponding class and age. So far as guns are concerned, the Bureau knows of none afloat or soon likely to be put afloat equal to those being manufactured for United States vessels now building.

"Designs have been made of gun mounts and other ordnance fittings to suit the various types of vessels now building, including the equipments and outfits under the Bureau's cognizance, and their manufacture is well in hand, there being every reason to believe that the ordnance and ordnance outfits will be in readiness for the vessels when they are ready to receive them.

"Work at the naval gun factory has been carried on continuously, the principal machines being kept running two and often three shifts of eight hours in 24.

"The number of guns completed since the date of the last report is 143—namely: Eight 12-inch of 40 calibers, one 7-inch of 45 calibers, 25 6-inch of 50 calibers, one 5-inch of 50 calibers, 31 4-inch of 50 calibers, one 3-inch

field gun, 40 6-pounder semiautomatic and 36 1-pounder automatic. Two hundred and fifty-six guns are partly completed, many of them being nearly so—namely: One 13-inch, 12 12-inch, 25 6-in, 64 5-inch, 29 4-inch, 100 3-inch (14-pounder), and 25 6-pounder. Eight 6-inch 30 caliber guns are in process of conversion, and one 13-inch gun is being prepared to receive a lining tube. One 4-inch 50-caliber gun, in which the rifling was worn out at the proving grounds, has had a lining tube inserted.

"In addition to the above, forgings are on hand on which no work has yet been performed for a large number of guns of all the calibers which are required to equip vessels authorized and building.

New Types of Gun Mounts.

"Plans have been prepared for a new type of mount for the 12-inch 40-caliber guns, in which there are but two recoil cylinders, located under the gun, the counter recoil springs being placed below the recoil cylinders and actuated by levers, which are attached to the yoke on the breech of the gun by connecting rods. By this means the recoil and counter recoil systems are placed entirely under the gun, and will be less liable to injury than was the case in some former mounts for this caliber of gun; the parts will be more accessible, and the springs, being under instead of in the recoil cylinders, as heretofore, can be more readily replaced, if necessary, and are always open to inspection. A type mount is now being made. The arrangement proposed allows of a reduction in the diameter of the barbette armor and of a reduction in the size of the port opening, both very important features.

"The latest type of 6-inch mount seems to fill the requirements satisfactorily. It is simple and strong; all parts are accessible; it has elevating gear on both sides and friction brakes in both the elevating and training gear; it works easily, one man being able to train and elevate the gun with facility.

Armor.

"Since the date of the last report all the armor manufactured under contracts made prior to that report has been delivered. This makes the total quantity of armor delivered for all vessels authorized prior to the 'Maine,' 'Missouri' and 'Ohio,' 34,971 tons, since the establishment of the armor plants in this country. The capacity of both plants is now about 7500 tons per year of armor of the best quality, and at the instance of the Department the manufacturers are making preparations to increase their output to from 10,000 to 12,000 tons per year, in order to complete deliveries under the present contracts within the times that the armor will be required for vessels now under construction, and also in order to be ready to provide armor for additional vessels that might from time to time be authorized by Congress.

"Under authority vested in the Department by Congress, contracts were signed November 28, 1900, for over 37,000 tons of armor required for vessels authorized and building, as shown in the following table, which gives the quantity required for each vessel:

	Tons.		Tons.
Maine	2,451	California	1,908
Missouri	2,451	Maryland	1,908
Ohio	2,451	Colorado	1,908
Pennsylvania	3,332	South Dakota.....	1,908
New Jersey.....	3,332	St. Louis.....	743
Georgia	3,332	Milwaukee	743
Virginia	3,332	Charleston	743
Rhode Island.....	3,332		
West Virginia.....	1,908	Total.....	37,690
Nebraska	1,908		

"The terms of these contracts are extremely advantageous to the Government both as to quality and to price. With respect to the former, comparing the tests made in this country with reports of those made abroad, our armor would seem to be the very best that can at present be produced; and the price at which it is obtained is considerably lower than paid abroad. Deliveries amounting to nearly 2000 tons have already been made under these contracts.

"During the year several tests have been made of experimental armor plates presented by inventors designed to improve the quality of armor, but in no instance has there been promise of improvement.

Submarine Torpedo Boats.

"The question of submarine boats seems to have occupied public attention to a considerable degree abroad, especially in France, but their utility has yet to be proven. As scarecrows they will, without doubt, prove useful for a time at least. It is but a short time ago that the very name of torpedo boat destroyers was sufficient to produce nervous prostration, but that has worn off to a large extent, and the destroyer is now relegated to its proper place as an auxiliary. The Bureau believes that undue prominence is being given to submarines from a naval standpoint. If they have any value it will be as an adjunct to the system of coast defenses; they cannot take the place of naval vessels of regular type or render a less number necessary. Unfortunately certain advocates of submarines try to show that the submarine boat is now the one and only one thing needed; that it is useless to build battle ships because, from their point of view, they can be readily destroyed by submarines, apparently forgetting the fact that naval battles for supremacy will be fought on the ocean far beyond the range of submarine or other torpedo boats, and that naval prestige consists in the possession of a fleet of seagoing armored vessels of the highest type and not in that of a number of small torpedo boats. This country might possess a great number of submarines without adding anything to its prestige as a naval power. So far as the Bureau is aware no new developments have taken place within the past year calculated to inspire a conviction that submarine boats have yet passed beyond the experimental age.

Armor and Armament for Proposed Vessels.

"Congress at its last session having directed the preparation of plans of battle ships and armored cruisers, the Department, following its usual custom, called upon the Board of Construction to prepare such plans. The chief of the Bureau of Ordnance being a member of said Board, and being especially interested in the questions of armor and armament for said vessels, submitted for the consideration of the Board a battery plan for the battle ships, consisting of four 12-inch 40-caliber guns in pairs in turrets and 20 7-inch 45-caliber rapid firing guns separately mounted on pedestal mounts in casemates, being of the opinion that such a main battery supplemented by a large number of 3-inch (14-pounder) and 3-pounder guns would best fulfill the probable requirements of naval warfare by the time the proposed vessels were completed. The armor plan contemplated a complete water line belt 8 feet in width and 10 inches thick abreast the machinery space; 9 inches thick in wake of the magazines, tapering to 4 inches at the extremities of the vessel; upper and lower casemate armor extending from barbette to barbette of 7 inches thickness, with transverse bulkheads at the ends 7 inches in thickness; 7-inch armor protection for the 7-inch guns on the upper deck, and 2-inch armor for the 14-pounders. The 12-inch turrets to be 10 inches thick, with 11 inches inclined port plates, barbets 10 inches thick and a heavy protective deck fore and aft. This scheme, with slight modifications, was adopted by three members of the Board, forming a majority thereof. The vessel being designed for a speed of 19 knots, and with a bunker capacity for 2000 tons of coal, her displacement on trial—that is, with 900 tons of coal and two-thirds ammunition and stores on board—would be about 15,560 tons.

"The minority, consisting of two members, favored a main battery of four 12-inch guns in two turrets, 12 8-inch guns in pairs in six turrets, four being arranged in quadrilateral and two being superposed on the 12-inch turrets, and 12 6-inch rapid firing guns on the gun deck in casemates. While the majority fully recognized the great strength and tactical advantage of the minority plan, it was of the opinion that a homogeneous intermediate battery of 20 7-inch guns of independent action would prove more efficient than 12 6-inch and 12 8-inch guns, especially as the 8-inch were disposed in six turrets, two of which were to be secured to the 12-inch turrets. The question of superposed turrets did not weigh much in the discussion, though the majority were of the opinion that the seven vessels already authorized with that novel feature of construction were sufficient,

and that the Department would not be justified in proceeding further in that direction on purely theoretical grounds. The real issue in the Board was whether the 7-inch guns should take the place of 6 and 8 inch guns. The argument submitted by the chief of the Bureau of Ordnance was that it was advisable to increase the caliber of the intermediary guns above that of 6 inches, owing to the increase that is taking place in the thickness of casemate armor and to the improved quality of armor now generally adopted. The 6-inch guns will not perforate 6 inches of Krupp armor at a distance of 3000 yards, whereas the 7-inch gun, with a remaining velocity of 2040 foot-seconds at that distance, will perforate about 8½ inches of armor. The 8-inch gun, on the contrary, has a great excess of energy as against casemate armor, but not sufficient to perforate the heavy turrets or the heavy belt armor. Moreover, its rate of fire is much slower than is that of the 7-inch, and made more so by being mounted alongside another gun in a turret. The 7-inch gun is essentially a rapid fire gun, both as regards its breech mechanism and mounting, and it can be readily pointed by one man using hand power only.

Big Guns and Shooting Quality.

"The majority objected to the large number of turrets embraced in the minority plan—namely, eight—being convinced that guns so mounted lost much of their efficiency, and recent experience seems to demonstrate the fact that the larger the gun the poorer its shooting qualities. Not that guns of large caliber are in themselves less accurate than those of medium and small caliber, but because of their lack of mobility and their environment on shipboard. If the lessons of the naval battle of Santiago de Cuba the 'Belleisle' experiment off the Isle of Wight; the 'Scorpion' experiment at Bermuda, and the recent record of target practice of the North Atlantic fleet teach anything, it is that very few hits are made with large caliber guns even under the most favorable conditions. At Santiago de Cuba out of 86 shots fired from 12 and 13 inch guns but three hits were recorded. In the 'Belleisle' experiment but two hits out of 15 shots fired from 12-inch guns were recorded. In the North Atlantic Squadron out of 26 13-inch shots fired none hit the target, which was of large dimensions. At the battle of Santiago de Cuba 319 8-inch projectiles were fired by the United States vessels, the number of guns engaged being presumably 18, the number of hits recorded being 13, or less than one per gun, the average number of shots per gun being 18. If the same ratio is applied to the 157 8-inch projectiles fired at the battle of Manila Bay, the number of hits would be 6.38, and as eight 8-inch guns were presumably engaged, the number of rounds per gun would average 19.7 and the number of hits would be less than one per gun. Having in view the foregoing facts, the Bureau is of the opinion that the 7-inch gun is well suited for the intermediate caliber in the proposed battle ships, and is preferable to a mixed battery of 6-inch and 8-inch guns.

"As regards the armored cruisers, the Board was unanimous in recommending a battery of four 10-inch guns in pairs in turrets, and of 16 6-inch 50-caliber quick firing guns in casemates, with a secondary battery of 20 3-inch (14-pounders) and 12 3-pounders. The armor protection to consist of a complete water line belt of 6-inch thickness from barbette to barbette, with 3½-inch armor to the extremities, the upper and lower casemate armor and gun protection on the upper deck being 5 inches in thickness, including that for 16 of the 14-pounders; 10-inch turrets and barbets to be 8 inches in thickness, with 8½-inch port plates. Individual protection to be given to the 6-inch guns by closed casemates on the upper deck, and by 2½-inch splinter bulkheads on the gun deck, and transverse bulkheads separating them into small groups. The displacement of these vessels to be about 14,500 tons on trial—that is, with 900 tons of coal and two-thirds of ammunition and stores. Speed, 22 knots; bunker capacity, 2000 tons of coal. From the above it will appear that these vessels should be able to take their place in the line of battle and compete with the majority of battle ships now afloat with reasonable chance of success."

W. L. C.

The Nash Gas Engines.

Among the large gas engines installed in the Power Court of the Machinery and Transportation Building, at the Pan-American Exposition, Buffalo, N. Y., which were notable for their size and the fact of regularly operating the rotary pumps for the fountains about the grounds, the National Meter Company of New York exhibited one of their 125 horse-power Nash gas engines operating the pump which furnished the large volume of water for the electric tower, and also three of the largest jets in the basin of the fountain. In another part of the Machinery Building there was a 50 actual horse-power Nash engine operating a 35 kw. belt driven dynamo, furnishing electric current for power purposes to numerous exhibitors who had machinery in operation. Here a cross sectional cut of the 125 horse-power engine will serve for the 50 horse-power one as well, both being of the same general type.

Both of these engines are of the four-cycle type, or one impulse over two revolutions, the regulation being

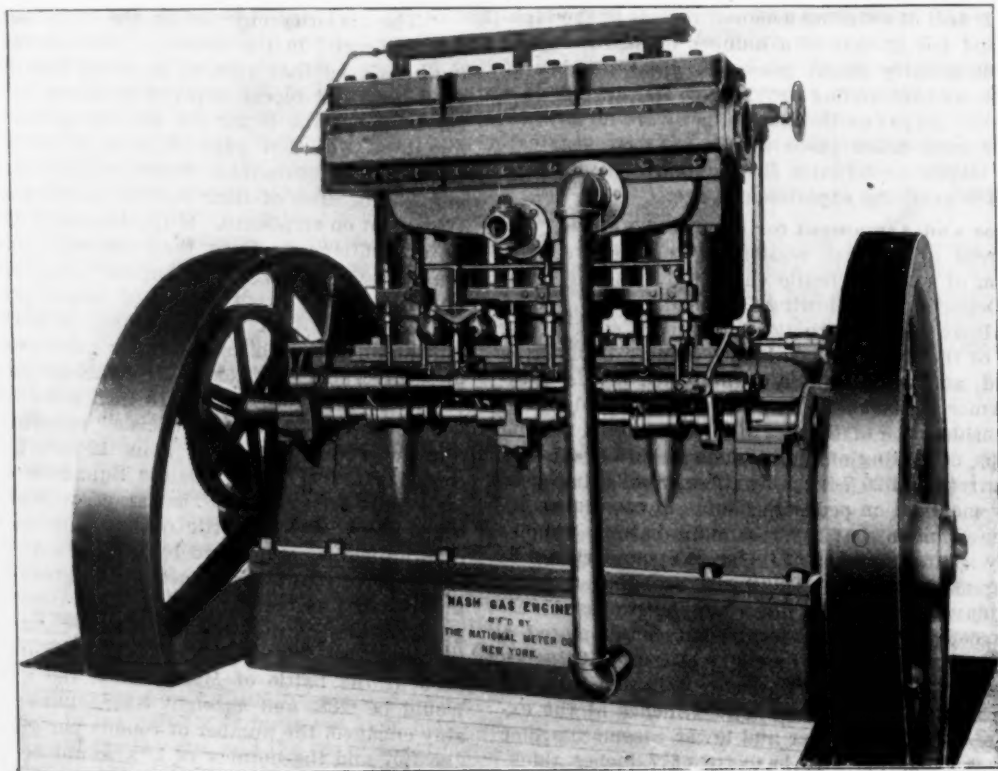
made of proportionately great length to diameter, and, like the cylinders, of a special iron. The pistons all have suitable expansion rings.

The crank shaft is in one piece of forged open hearth steel, cut from the solid; the shaft is machined all over, and runs in adjustable bronze boxes, so arranged that each crank has a bearing on each side.

The connecting rods are forged from open hearth steel, the crank end being of the marine type, with adjustable boxes, of a special, hard bronze, while the end connected to the piston is formed into a solid eye bushed with bronze, easily renewed when necessary. Owing to the liberal proportions and thorough lubrication of the bearings at the piston end, so little wear occurs that no other adjustment is needed.

Operation.

It will be noted by the cuts that all the valves and the whole valve motion are conveniently located on the working side of engine. A single cam shaft, driven by a pair of spur gears, operates all the valves through levers and rollers. Each cylinder has its own admission, gas



THE NASH 125 HORSE-POWER GAS ENGINE.

obtained by a governor acting upon the hit or miss principle.

Design of Engine.

The cut, Fig. 2, shows a cross section through one cylinder of the 125 horse-power gas engine, and exhibits the working parts common to all Nash engines of single-cylinder, two-cylinder and three-cylinder form. Referring to the cross section, it will be noted that the engine is of the vertical, inclosed, self oiling type. The cylinders are all separate castings, independent of each other, and are mounted on the crank case forming the upper part of the frame which incloses the pistons, main bearings, connecting rods and other working parts; all of these are lubricated by the oil contained in base being dashed over them when the engine operates. Provision is made also for lubricating them independently by an automatic sight feed oiler.

The cylinders are made of a special, hard and close grained iron, very durable in service. All cylinders are water jacketed on the sides, heads and valve cases, to prevent undue heating; they are drained at the lowest point, and so constructed as to be easily repaired or replaced. Trunk pistons, single acting, of simple form are used, and since these act as cross heads as well, they are

and exhaust valves, the admission valve being shown with its cam, roller and lever, and the gas valve with a pawl, engaging a toe carried on the admission valve stem, so that either both of these valves open together, to admit a charge for the power stroke, or else the governor acts to disconnect the pawl, the gas valve remains closed and no charge enters, until standard speed is restored, according to the principles of regulation by missed ignitions. Whenever a charge is missed, the admission valve still permits air to enter, which is compressed, expanded and exhausted, cooling the cylinder and cleaning it of any remaining products of combustion.

The exhaust valve is located immediately behind the admission valve, and the exhaust connection with its flange appears at the upper right hand of cylinder. Immediately below this is the flanged opening by which gas enters the mixing chamber, and, surrounding the upper part of the gas connection, is an annular opening through which air passes and is mixed with the entering gas for a charge.

The valves are made of drop forged steel with long stems, carefully fitted to bearings and guided at top and bottom, thus securing an accurate seating with-

out any side springing to occasion wear and leakage. Inserted valve castings are not used in the Nash engine, since experience has shown them to become so distorted by heat as to either leak or break. Moreover, it immediately complicates the design, and renders efficient cooling of the valve case and valves much more difficult. In the light of long experience the builders of this engine have so designed the cylinder and valves that after the first regrinding, performed some time after the engine is started, the valves wear so slightly and become so little coated with carbon that no further attention is required for a long while, sometimes a year or more.

shall act to open the gas valves or keep them closed, as demanded by the load upon the engine. Each cylinder has its own gas valves, and is governed independently of the others. The 125 horse-power engine has three cylinders, each $13\frac{1}{2}$ inches in diameter and 16-inch stroke, operating at speed of 225 revolutions per minute. It will be observed that these speeds are quite moderate, although the vertical type of engine would safely permit considerably higher ones.

Self Starter.

Each of the engines is provided with a suitable self starting device, operated by compressed air, since they

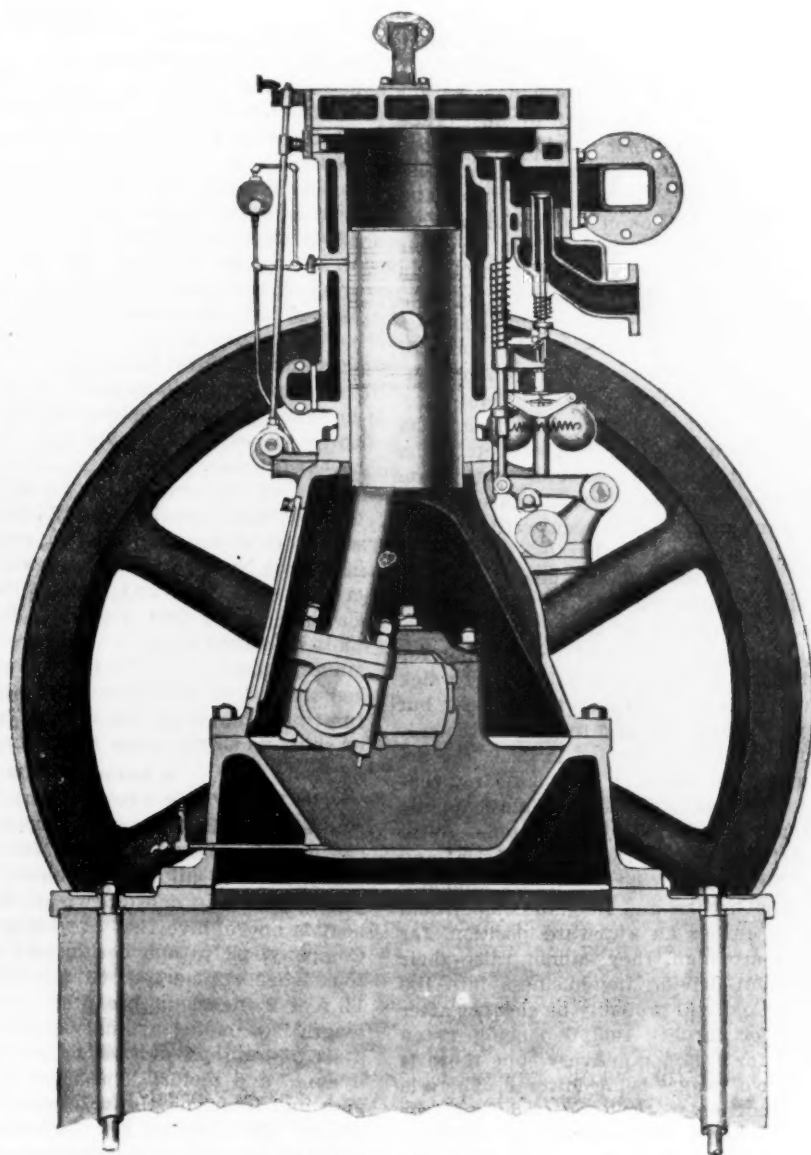


Fig. 2.—Cross Section Fig. 1.

THE NASH GAS ENGINES.

Electric igniters of the make and break type are attached to each cylinder, being operated by separate eccentrics carried on a shaft located on the side opposite the valve motion, and driven from the cam shaft by means of a cross shaft and two pairs of miter gears. The igniters are independent of each other, and are provided with means of adjustment to accurately time the ignition, as desired, without stopping the engine.

A special form of fly ball governor, driven by bevel gearing from the cam shaft, is used for these engines. It operates by the method of missed ignitions, and secures a remarkably steady speed, even under wide variations in the load. The governor is very sensitive, and more especially so because it does not operate the gas valves directly, but simply indicates by the position of a lever, to which it is connected, whether or not the lifting pawl

are too large to be conveniently started by hand. The air starter consists essentially of an air compressor, an air reservoir and suitable valve mechanism to operate one of the cylinders by compressed air. The action is as follows: A single movement of the starting lever, shown at the left hand in cut, of the 125 horse-power engine throws into action supplementary cams, so that the right-hand cylinder operates as a single acting compressed air engine, while the other two are placed in position ready to start up with gas. As soon as speed is attained, by means of the first cylinder, an ignition occurs in the other two cylinders, the starting lever is moved back to its normal position, the air starting mechanism is disconnected and the machine operates as a gas engine. The whole device is very simple and satisfactory in operation.

Iron, Steel and Shipbuilding in Scotland.

GLASGOW, October 2, 1901.—The iron and steel trades here are still actively employed and promise to be so all winter, owing to the amount of work booked by the shipbuilders. But the demand for new ships has abated very considerably, and German material is being pressed for sale in all directions. Even hematite pig iron is now being offered from Germany, and two or three cargoes have been received here. This is quite a new feature in the trade. Of course a good deal more pig iron is consumed in Scotland, in normal times, than is made in Scotland. We obtain foundry iron from Cleveland, and latterly from Nova Scotia, and hematite iron from Cumberland, with an occasional odd lot from Bilbao, Spain. A supply from Germany is quite a novelty, for Germany has always been accustomed to buy crude iron from Scotland and Cleveland. It does not, however, betoken anything more serious than the fact that overproduction is still excessive in the Fatherland, and that producers of crude as well as of finished iron there are compelled to find markets where they can for their surplus, regardless of prices. The story raised by a London newspaper about a great iron ore and steel making combine being formed in Spain has caused much amusement here. At present blast furnaces in the north of Spain turn out about 300,000 tons of pig iron per annum, and there is not ore enough in sight to tempt any one to build any more furnaces. The best iron mine in the south of Spain is in the hands of a Scotch firm of ironmasters, who themselves consume every ton of the output, and who will certainly not share in any combine. A lot of nonsense has also been written about projected combines in the Scotch coal trade.

The market for iron warrants has been adversely affected by the drop in copper, but this has had no effect on makers' prices. Not for a long time, however, has the foreign demand been so poor, and were it not for the strong home demand crude iron would be very sick indeed. The output here is now quite up to last year, but in Cleveland it is very much less, and forge iron there is reported to be actually scarce. But so large is the decline in foreign demand for ordinary Cleveland iron that even with the reduction made the stocks in the public stores were last month augmented by 10,662 tons. With the steady demand there is here for steel material and for some forms of finished iron, prices would undoubtedly be higher but for German and Belgian competition. Our producers are in rather an awkward position, for although their costs are high, they cannot raise their own quotations without driving the business into the hands of foreigners. Coal will probably be cheaper after this month—though for furnace fuel 6 pence per ton more is being asked for October delivery—but there is no immediate prospect of wages being lowered. There is a renewal of severe cutting in the tube trade, and the Scotch makers have severed their connection with the English Association because of various disagreements. Recent cuts have brought down prices about 25 per cent. and the competition is very keen. Notwithstanding the slackness of early summer, Scotch steel makers made an output of 495,400 tons of open hearth ingots in the first half of the current year, or very nearly one-fifth of the whole output of the United Kingdom. The northeast of England came next, with 473,425 tons, and Wales third, with 316,440 tons. Sheffield is a good way behind Wales, but comes fourth, with 174,633 tons. Lancashire and the northwest of England reckon for only 75,732 tons, and the rest of the producing districts total up to 97,324 tons.

The Shipbuilding Industry.

The Scotch output of new ships last month was 21 vessels, of 40,600 tons, of which 17 vessels, of 38,920 tons, were launched on the Clyde. The month's total compares with 35,325 tons in September, 1900. It is the biggest September's total except 1899, when the output was 47,816 tons. It is, therefore, a good record, and it brings up the total output for the year so far to 395,426

tons. The records of the month and of the nine months since 1890 thus compare:

Output of Scotch Shipyards.

Year.	January to September, nine months.	
	September. Tons.	Tons.
1890.....	39,678	304,094
1891.....	27,470	257,839
1892.....	46,385	319,510
1893.....	18,565	209,681
1894.....	38,642	271,056
1895.....	39,077	287,088
1896.....	37,234	285,949
1897.....	18,708	229,070
1898.....	42,037	316,300
1899.....	47,816	367,526
1900.....	35,325	356,685
1901.....	40,600	395,426

Thus the present year tops the record, and the builders still remain thronged with work. Of last month's new tonnage, 1350 tons are for France, 1000 tons for the British Government, and 850 tons for British colonies, all the rest for English, Scotch and Irish mercantile owners.

The demand for the class of big cargo tramps has been arrested by the great drop in freights, which certainly offer no prospect of profit on steamers built at present range of costs. The new orders have suddenly dropped from 50,000 tons per month to about 15,000 tons. That was about the sum of the new contracts booked in September.

Nothing has yet been heard of the old Admiralty contracts under the last naval programme, but they will doubtless be placed before the end of the year. As it is, however, our builders are well supplied with work for a year to come.

One of the new Union Castle liners, the "Alnwick Castle," was launched by William Beardmore & Co., who recently acquired the long established building yard of Robert Napier & Sons, and who are themselves makers of steel ship and armor plates. The "Alnwick Castle" is the first vessel in Scotland to be entirely built of American steel. Other vessels which are being simultaneously built for the Union Castle line are being constructed of British steel, so there will be an opportunity of comparing the durability, &c., of the material of ships under the same management.

A Submarine Boat.

The launch this week at Barrow of the first submarine boat for British naval purposes excites great interest in shipbuilding and engineering circles. She was launched with all her machinery on board, as is the practice in only one or two of the Clyde yards. This boat is one of five that are being built by the Vickers Company, all to one design and model, displacing 120 tons when submerged, 63 feet 4 inches in length and 11 feet 9 inches in breadth. One-third of the boat's length is occupied by the machinery, which consists of a set of four-cylinder gas vapor engines and an electro dynamo and motor. The shaft is in the center of the boat and is driven through spur gearing. The gasoline engine will develop 200 horse-power, sufficient for a speed of 10 knots on the surface, with the conning tower 2 feet above the water. At this level of submersion the boat can be driven for 400 miles at full speed on a consumption of less than 1 pint of gas spirit per horse-power per hour. Submersion is effected quickly on the duck diving principle, and not on even keel, as in the French boats. For diving purposes horizontal rudders are provided, with automatic gear for regulating the water tanks, and the rudders can be set for any depth of immersion. When the boat is submerged the electric motor will drive the propeller at a speed of 8 knots. The batteries will provide alternating current for five hours' submergence at this speed, and they can be charged again at sea by turning the gas engine on to the electric machine. This boat is believed by experts to be a great improvement on the French type.

A syndicate were recently formed by Glasgow and London people for the development of industries in India. Special attention is being devoted to sugar growing, and a complete outfit of machinery has just been completed for the syndicate by McOnie, Harvey & Co., Limited, Glasgow. This consists of a double crushing

plant of two mills driven by one engine, one of the firm's patent triple effect evaporators, juice heaters, clarifiers and subsiding tanks, concentrating pans, boilers, &c. The capacity of the plant is 6 tons of basket sugar per day, and by the time it reaches India the works there will be ready for it. The imposition of countervailing duties on bounty fed sugar entering India renders possible the profitable development of the cane sugar industry there. Hence the present venture, in connection with which five separate sets of plants have been already ordered, and more are in contemplation. B. T.

The Cincinnati Metal Trades Association.

CINCINNATI, OHIO, October 25.

The organization known as the Cincinnati Metal Trades Association has been in existence now for some little while, but probably never until within the past six months did it amount to as much as its promoters intended it should. Upon the principle that it takes a war time to develop the actual strength of an army, so it took such an occurrence as the great machinists' strike of last summer to fully test the value of the idea which is embodied in the organization. The strike, whatever else it did, called the association into active life and proved beyond question just what a compact, well directed body of this description can do when the demand is made upon it. It did not take very long after the first contact with the strikers to prove that the metal of the association had been duly tempered to that much desired point just midway between the break and the bend. The association is composed of almost every shop owner in the city, those outside being mainly the proprietors of the job shops and a few small tool makers whose stand with the strikers, or whose neutral position, to say the least, did not carry very much weight.

At the beginning of the strike the association secured rooms in the Odd Fellows' Temple on the corner of Seventh and Elm streets, and with the aid of the telephone and the regular daily gatherings managed to keep an almost uninterrupted session until the last gun was fired and every striker was back in the ranks at work again.

In reviewing the history of the situation it is evident that the work of organization was never better proved, and the victory, which was an overwhelming one, perched on the banners of the Metal Trades Association. Now that the troubles of the season, which called the members into such close contact with each other, are over, it was determined to celebrate peace, as well as prosperity, with a banquet, which accordingly took place a few nights since. Practically all the members of the organization were present. The officers, by the way, are Walter Laidlaw of the Laidlaw-Dunn-Gordon Company, president; Fred. Geler of the Cincinnati Milling Machine Tool Company, vice-president, and Earnest De Brul of the Miller, De Brul & Peters Mfg. Company. The speakers for the evening were Edwards Ritchie, a prominent attorney of Cincinnati, who gave a very pertinent address on "The Era of Consolidation." Benjamin Sebastian of the Sebastian Lathe Company followed with a talk on "Sales and Distribution." William Lodge of the Lodge-Shipley Machine Tool Company gave a characteristic talk on the "Science of Manufacturing." *The Iron Age*, by the way, was well represented at the table, S. G. Hobson, the English representative of the journal, being present, as well as Henry Smith, the Cincinnati manager. Both of these gentlemen favored the company with papers, Mr. Hobson on the question of "English Export Trade," and Mr. Smith on the "Science of Advertising." The following is a brief abstract of Mr. Sebastian's and Mr. Lodge's remarks.

Benjamin Sebastian on Sales and Distribution.

Mr. Sebastian said: When a business is started, the first thought is as to how and where the output is to be disposed of, and the parties interested naturally turn to those who have preceded them for experience. It is sometimes thought by the inexperienced that about all that is necessary in the beginning is to prepare for cus-

tomers, that custom will seek you, and that the excellence of your output will expedite the disposing, and, in a great degree, eliminate trouble. But let me say that it is only those sadly in need of experience who have such ideas, for there never was a time in the history of business when the office end of a business was of so much importance as it is to-day.

"In the business that is so largely represented here to-night, that of the manufacture of machine tools, it is found that trade is secured in two ways mainly, first by advertising, and, second, by personal solicitation or arrangement with machinery dealers in the various centers of trade, who, in turn, do the advertising. In advertising one wants to be somewhat experienced to be able to select the best medium among all those offered to him through which he can reach the people who would be likely to buy his goods. Sometimes, even with the best experience, he will be imposed on, and find that he has placed his advertising where it will accomplish nothing. My advice, based on my own experience, and the observation of the experience of others, is that it pays only to use those journals which are universally recognized as reputable, and which have an established standing in the trade from which we seek business. I believe it was Wanamaker who advised that in the distribution of expenses you allow as much money for making your business known to the public as you pay in rent, and our experience undoubtedly proves that there is good logic in the advice. One cannot well put too much money into good advertising journals, nor too little in the inferior publications. Having selected your journals, use them liberally. Strive to make your advertisements effective, telling and artistic. Let them convey the idea that you have faith in what you are advertising, and this, in turn, will produce a faith in you in the minds of the readers of your advertisement. Don't get into a rut. Change the composition and method of display often. Let me also advise that you take advantage of all free notices that are offered you, and at no time offer anything that you cannot deliver if called on.

"Again, having secured the attention of a possible customer, it requires more tact to close a sale with him than it does to attract him to you in the first place. This is especially so if the article you have to dispose of has not as yet fully established its reputation on the market. As faith, hope and charity are the pillars of spiritual life, so honesty, integrity and truthfulness are those of a successful business career.

"The next thought is as to distribution of our product. Time was when a manufacturer of any article sought only to interest those in his immediate vicinity, but with the growth of mail and telegraph systems and the extension of the various methods of distribution, we find our world enlarging and ourselves reaching for territory wherever we can find it. Nowadays it is but a small business that is satisfied with the trade of its own community, its own State, or even its own country. As manufacturers we are even now finding, or rather creating a demand for our output in every country in the world, and our motto is that the world is our field."

William Lodge on the Science of Manufacturing.

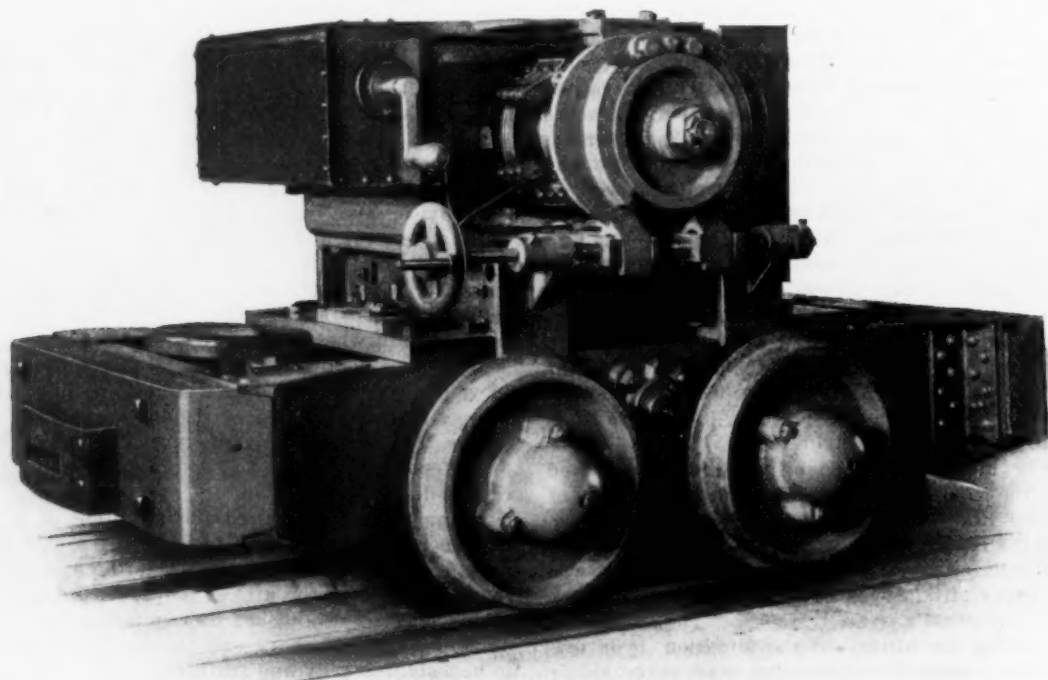
Mr. Lodge's remarks are partially outlined as follows: That as Americans we point with a considerable degree of pride to our status as a manufacturing nation, and that it is in manufacturing that our continued success must be, only that in manufacturing our study must be hard and our discipline severe to continue the improvement which has led up to our present degree of success. In this connection Mr. Lodge used the word "manufacturing" in a peculiar wholesale sense. That manufacturing in general has not yet reached that high state of development of which it is capable excepting in a very limited number of lines, and that just as the great success of Americans has been in planning and pushing, so their continued success must be from the evolution of these same methods. In many of the European countries there are companies who build machine tools who also build farm implements, cannon, or, in fact, almost any other line of machinery, and they will even accept an order for a single machine tool to be built from the drawings up. This class of shops, according to Mr. Lodge's

interpretation of the word, cannot be classed as manufacturing concerns, and this idea of a diversified product is not generally regarded in this country as possible of the same development which the concentration of energy on some one particular line is. There are probably few, if any, concerns in the United States doing anything of a business at all who would attempt the manufacture of a single tool to be built from the drawings. Further than that the number of companies in this country who will accept orders for a machine other than according to their regular line of manufacture is extremely limited. Mr. Lodge served his apprenticeship in England in a shop devoted to the manufacturing of textile machinery, where the system and arrangement, as well as the magnitude of the operations justified them, in his estimation, in being classed as manufacturers. In that shop the force was divided in gangs, the first laying the foundation of a machine, and then passing to the next floor space and repeating the same process throughout the length of the

ceed with the erection of a plant in St. Petersburg, where property has been purchased adjoining the plant of the Westinghouse Air Brake Company.

The Morgan Combined Third and Traction Rail System of Haulage

The combined third and traction rail system of haulage of the Morgan Electric Machine Company, Monadnock Block, Chicago, has been thoroughly tested in several mines, notably at the Sarah mine of the Pittsburgh Coal Company, at Douglass Station, Pa., where it is working on a 10 per cent. grade against the load, and at the Harrison mine of the Big Muddy Coal & Iron Company of St. Louis, Mo., where it is hauling a large output on a 5 per cent. grade. This system is claimed to be the only successful one whereby the conductor to supply the current and the traction to drive the loco-



THE MORGAN COMBINED THIRD AND TRACTION RAIL SYSTEM OF HAULAGE.

shop until they were ready to commence on floor space number one again, in the meantime having been followed by a second and third set, each gang advancing the construction another degree, and then, in turn, giving place to another set of men, the last gang being the packers and shippers, and after them coming in rotation the first workers, laying the foundation of a new series. Mr. Lodge's inference was that this system or any systems which were highly developed could only be properly tested or carried out in the larger shops, in which the buildings had been planned with that end in view. He spoke strongly and evidently from pronounced conviction on this point, assuring his auditors that there were wonderful possibilities in the study and development of manufacturing. That the very best of talent is requisite to carry out these ideas goes without saying, and bright, active, level headed mechanics are necessary to devise ways and means of progression above that which is common practice.

The banquet was a pronounced success in every way, and it was especially so from a social standpoint. The Metal Trades Association is doing a good work, and its usefulness is evidently extending.

R. H. S.

The directors of the Westinghouse Electric & Mfg. Company, at a meeting held last week decided to pro-

ceed along the track are combined in a single third rail. Illustrations of the system are presented herewith, Fig. 1 being a perspective view of the engine, Fig. 2 a cross section showing the location of the third rail and Fig. 3 a side elevation showing the arrangement of the sprocket wheels.

The locomotive consists of a substantial steel frame mounted on suitable track wheels. Into this steel frame are mounted two steel sprocket or traction wheels, Fig. 3, which are driven by an electric motor, contained in the body of the locomotive, by means of suitable gearing. The sprocket wheels A, which engage the third rail C, serve the double purpose of driving the locomotive along the track and taking up the electric current from the third rail to feed the electric motor, the track rails being used as the return conductor. These wheels are geared to always run in unison, avoiding all difficulty in crossing switches or other openings in the track.

The third rail consists of heavy iron bars perforated at regular intervals throughout their entire length, and made into a continuous rail by means of fish plates much after the manner of regular track rails. This continuous rail is inclosed and depressed in a specially prepared wood casing, which serves the double purpose of insulating the rail and protecting men and animals from the current. It is laid 5 inches off the center of the regular

track, thus giving room for the animals to work and avoiding interruption to the working of the mine while the plant is being installed.

The advantages of this system, as demonstrated, are stated as follows: Positive working, practical to use on light rails and on excessive grades, flexibility, little liability to cause explosions, as the conductor is close to the floor, high efficiency and cleanliness. Power may be taken off the line at any point to light the mine or run machinery.

It affords perfect safety for men and animals, as it is impossible for them to come into contact with the electric current. No sand, trolley pole, or trolley wires are used. It is also free from an objection to the overhead wire in the case of a falling roof, as even very heavy falls will not injure the third rail. Other advantages over the trolley wire are obvious.

The locomotives of this system, in the mines mentioned above, are regularly hauling as heavy loads as the shown capacity of a 15-ton traction locomotive on level tracks, and, in addition, are working on grades where it

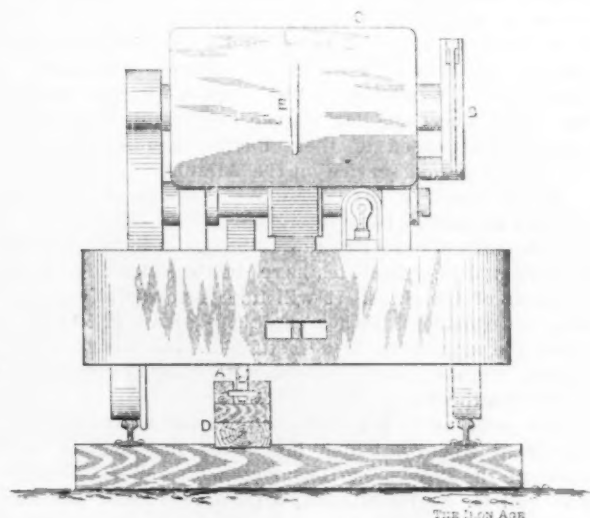


Fig. 2.—End View.

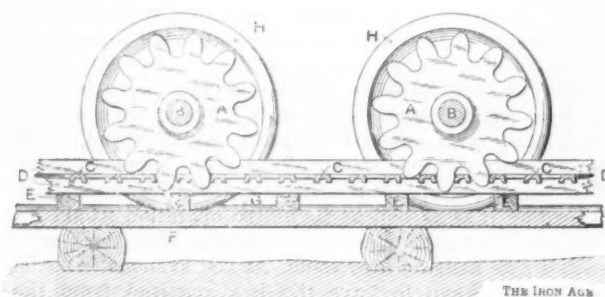


Fig. 3.—Side View.

THE MORGAN COMBINED THIRD AND TRACTION RAIL SYSTEM OF HAULAGE.

would not be practicable for traction locomotives to work.

A Decision on Aluminum Patents.

Judge Hazel has rendered his decision in one of the most important cases ever heard in the United States Court of the Western District of New York. In the decision Judge Hazel dismisses the action brought by the Electric Smelting & Reducing Company against the Pittsburgh Reduction Company of Niagara Falls. The action was an equity proceeding brought against the Pittsburgh Reduction Company for an alleged infringement of a patented process for cheaply separating aluminum by the use of electricity. It was begun in Circuit Court, April 6, 1897, and was argued the following December. In the complaint it was alleged that the Pittsburgh Reduction Company, in all of their plants, one in Pittsburgh and two in Niagara Falls, infringed two patents relating to the reduction of metal from an ore by the use of an electric current, which patents were owned by the complainants. Many expert witnesses were sworn, and the exhibits made were numerous. The testimony taken amounted in all to over 3000 printed pages.

In his decision Judge Hazel held that the defendant company did not infringe the patents of the plaintiff, which, in effect, means that the Pittsburgh Reduction Company will be allowed to continue the manufacture of aluminum. As this company can make the article by their process much cheaper than by any other known process, it follows that the company practically have a monopoly of the manufacture of aluminum.

Judge Hazel's decision is set forth in 40 typewritten pages, and in it he reviews the case at great length, going over much of the testimony, cites many opinions of other judges, and gives a brief history of the reduction of metals by electrolysis. The two patents owned by the complaining company were issued to the inventor, Charles C. Bradley, in 1892. They relate to a process of reducing highly refractory and non-conducting metallic ores in a fused state by electrolysis—that is, by subjecting the ore or compound to an electric current, to fuse it and, while in fusion by action of the current, to separate or decompose the fluid mass so that the metal contained in it will be deposited at one of the two poles of the electric heater. Three clauses of one of the patents cover the process broadly. Three others of the same patent cover specifically the process to be used in the reduction of aluminum. The other patent covers a special mode of practicing the process.

The defense made various answers, among which was want of novelty in the patents. The alleged infringement was denied. The Pittsburgh Reduction Company said that they worked under a patent given in 1899 to an inventor, C. M. Hall. The two processes covered by the three patents are very similar. In fact, the suit just decided may be looked upon as a return suit, for shortly before the present one was started the Pittsburgh Reduction Company sued the Cowles Smelting & Aluminum Company in an attempt to get dam-

ages for and stop the infringement of the Hall patent. The Cowles Company were the predecessors of the Electric Smelting & Aluminum Company. Nothing was accomplished by the suit, except that various technical terms were defined, and there was established a fixed meaning that greatly aided in the trying of the present case.

The opinion states that the Bradley process was never put into practical operation. The complainant argued that Bradley was the pioneer in that field, and so was entitled to many benefits and everything relating to the process. But to quote from the opinion:

"Hall, ambitious, vigorous and intellectually strong, experimented and produced a process in aid of decomposition of refractory ores not contemplated by the complainants' patents."

It was stated in the opinion that the entire consumption of aluminum in the United States is supplied by the Pittsburgh Reduction Company; that in 1886 the price of aluminum ranged from \$5 to \$8 a pound, that in 1897 the price was about 25 or 30 cents a pound; that at first, when the Pittsburgh plant of the defendant company was started, only 50 pounds were produced daily; that soon afterward two large plants were built in Niagara Falls, using a total of 6000 electrical horse-power and producing daily 9000 pounds of aluminum.

In reaching a decision Judge Hazel was guided somewhat by the previous suit. He held that Hall's invention was not an alteration of Bradley's process, and that one ingredient in the chemical bath used had not been substituted for another. The decision was extremely technical. Judge Hazel went to great length in studying both processes for the reduction of aluminum.

Canadian News.

Ontario Mineral Tax.

TORONTO, October 26, 1901.—About two years ago the Ontario Legislature, at the instance of the Commissioner of Crown Lands, passed an act to amend the Mines act in several particulars. One of the changes made provided for imposing taxes on the output of the mines, which taxes were prescribed in a schedule. It was further provided that in all cases where the ore was treated exhaustively in Canada, instead of being exported in a more or less raw state, the tax paid should be refunded. The real effect of the law was to impose export duties on the crude mineral products of the province. Only in such a roundabout way would it be possible for a province to make exportation an occasion for taxation, for the control of the taxing power in regard to the foreign trade of the country is in the hands of the Dominion Government. It was also enacted in the amendment to the Mines law that these mineral taxes should not go into effect until imposed by an order in council. Thus the matter was left to the discretion of the Ontario Government, which has never seen fit to enforce the taxation clause. Nor does there seem any likelihood that it will enforce it. The law was aimed at the Canada Copper Company, but the people of the Sudbury district petitioned against it. Not only did it alarm them by threatening the great nickel smelting industry the company operate in the nickel country, but also by tending to warn off new enterprise from venturing into nickel production. Numerous complaints were made by promoters and brokers having mining lands to sell that the change in the law had caused to be broken off negotiations that would otherwise probably have resulted in new works being established. The protests against the mining taxes have been kept up, notwithstanding the Government's course in refraining from imposing them. The opponents of the law declare that the uncertainty regarding it is as bad as its active operation would be. Nobody, they say, will go into mining operations with such a risk hanging over them. At last systematic measures were taken to have the law removed from the statute book. The Dominion Government has a power of disallowance in regard to acts passed by the Provincial Legislatures, but that power must be exercised within two years after the passing of the legislation. Appeal was made to the Dominion Government to disallow the Mines act in so far as that provided for taxation. The Dominion Government declined to go to that extremity, but an agreement was arrived at between it and the Ontario Government to have the constitutionality or equity of the law referred to the law officers of the Crown.

On the 23d inst. the Hon. Edward Blake, one of the foremost members of the Canadian bar, but now residing in London and representing South Longford in the Imperial Parliament, visited Ottawa and held a long conference with the Canadian Minister of Justice, Hon. David Mills, in reference to the Mines act of Ontario. It is expected that an arrangement will be arrived at that is satisfactory to the mining interests. If the Dominion Government does not disallow the act or the Ontario Government repeal it, the Canadian Mining Association will, it is said, endeavor to have its constitutionality tested before the courts. It is difficult, however, to see how it can do this before the law is enforced and a particular case of resistance to it arises.

The Fast Atlantic Project.

Discussing Sir Christopher Furness' visit and its probable bearing on the fast Atlantic steamship enterprise, Lord Strathcona, Canadian High Commissioner in London, who is still in Canada, says:

"That is a matter between Sir Christopher and the Government. It is true we talked the matter over during his stay here, and we both do, as I am sure the Government does, realize that the St. Lawrence route should be made as safe as human foresight can make it. If it is true, as Sir Christopher says, that the insurance rate for Canada is from 7½ to 8 guineas, as against 3 to New York, Boston and other American ports, we are heavily handicapped, and the Government should, and I am convinced will, do all in its power to improve the

route, if this is possible. If such drawbacks exist, as it is claimed, there is no sentiment in this question of insurance; it is purely a business matter. Competition is too keen nowadays for any sentiment to intervene, and if it were safe to take lower rates you may be sure there would be plenty of offers.

"I think for the present he has merely come to look over the ground, and, as he says, to report to his associates, and I presume if he can obtain the subsidy he wants he may make some kind of proposal. If the Government sees its way to grant a subsidy which would meet with his views I have no doubt he would be willing to tender for the service. He is firmly convinced that only a first-class service will be of any use, a fast service, a service that can compete with American lines.

"I cannot speak for him, but for myself I cannot but think that the port must be the one giving the shortest sea passage from land to land, and I should think some point in Cape Breton is the place if it affords good harbor accommodation, and where passengers, perishable and certain other kinds of freight can be taken on board. That is the only way we can ever secure a thoroughly efficient and up to date service. I have always taken a very great interest in this question. I have been working at it for years, and I have always maintained that it was a necessary adjunct wherewith to maintain the reputation of our trans-continental route to the east. The Canadian Pacific are taking steps to accelerate the speed of their Pacific steamers, and we must have a fast service on the Atlantic."

In an interview Sir Christopher Furness showed that he was at least as fully interested in the scheme as Lord Strathcona's statements represented him to be. He said that he and his associates have the capital ready for the building of the ships. It will take a powerful organization, he considers, with a capital of about £2,500,000 to meet the exigencies of a fast line. His views, he declared, were in entire accord with those expressed by Lord Strathcona.

He was very favorably impressed with the steel works at Sydney, which he visited in company with some of the directors. He, along with Senator Dandurand and G. E. Drummond, also visited Sault Ste. Marie to look over the Clergue industries. He expressed himself as quite overwhelmed by the immensity of these enterprises. What struck him most forcibly was the economy of labor attained by Mr. Clergue, and the mighty power house, said to be the greatest in the world. The 80 dynamos have a capacity of 50,000 horsepower. He had an interview with Mr. Clergue on the matter of reducing the insurance risks in the St. Lawrence. Mr. Clergue, it may be remembered, is the organizer of a company incorporated at the last session of the Dominion Parliament to go into the marine insurance business. They are called the Canadian Lloyd's, their object being to take over risks on the Canadian route at a more reasonable rate than the British underwriters are charging.

Dominion Iron & Steel Company.

There was a meeting of the directors of the Dominion Iron & Steel Company in Montreal on Tuesday. It had been rumored that at this meeting another issue of stock would be recommended, to provide money for the completion of works. This appears to have had no foundation. Mr. Whitney said that it was not the intention to increase the capital stock. Any money that may be required for completing the buildings can be had, it is understood, from three of the leading banks of the country. The company are turning out a large quantity of pig iron. In September their two furnaces produced 15,357 tons. The fires were lighted in the third furnace a few days ago, and in the first cast from it there were 40 tons of No. 1 grade. A vessel is now due at Montreal with 4000 tons of the company's iron, and another will shortly be dispatched to England. It is expected that next year about 40,000 tons of pig iron and from 60,000 to 70,000 tons of steel will be turned out. One-half of the steel plant ought to be in operation in January next.

Minor Notes.

The Ontario Government has finally decided that the exportation of natural gas from this province must

cease. If necessary, it will cut the company's pipe line to stop the draining of the gas across the Detroit River.

The British War Office has awarded to the Victoria Machinery Depot, at Victoria, B. C., a contract for building two twin screw steam launches for the submarine mining service connected with the defenses at Esquimaux.

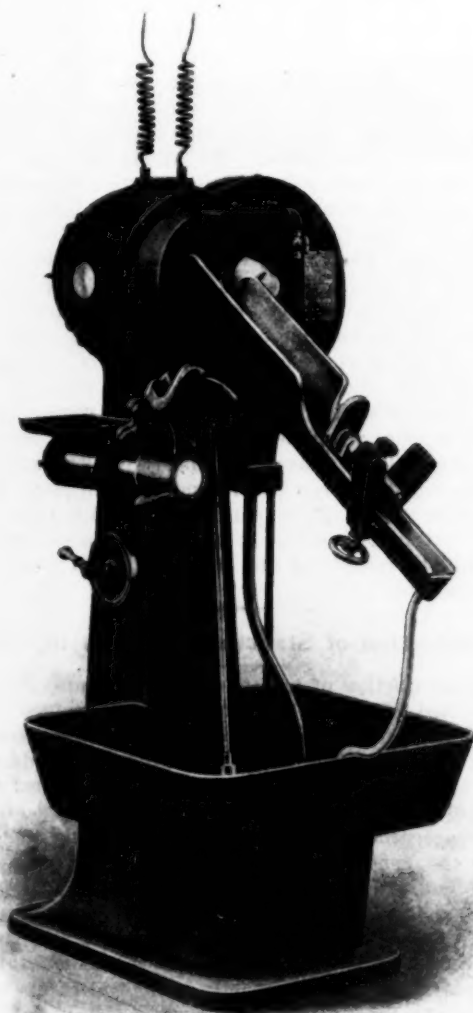
W. Abraham, M.P. for Mahen, Wales, is visiting Canada, to inspect the coal mining industry. He has heard that the coal cutting machinery in this country and the United States is superior to that in use in the United Kingdom.

Machinery for the manufacture of projectiles for the Canadian Government has arrived at Quebec. It will be placed in position at once, and the manufacture of steel shells will be begun.

C. A. C. J.

The New Yankee Wet Drill Grinder.

The new Yankee wet drill grinder built by the Wilmarth & Morman Company of Grand Rapids, Mich., will



THE IRON AGE

THE NEW YANKEE WET DRILL GRINDER.

handle drills from $\frac{1}{4}$ to $3\frac{1}{2}$ inches. The motor is of the compound wound type, and is inclosed in a dust proof case located on top of the column. The emery wheel is driven direct, being mounted on one end of the armature shaft. The starting box is conveniently located in the column. Water is supplied to the wheel by a centrifugal pump, and the whole grinding face is flooded so that there is little danger of drawing the temper on a drill even when grinding heavily. The water is returned by the pipe leading from the lower end of the wheel hood, and a rubber tube connected to the back end of the holder takes care of the small amount that trickles down the bottom of the V. The returning water first enters a settling space, where the heavy grindings remain,

so that when reaching the pump it is clear again. There are no bearings of any kind under water or in any way exposed to the wet or grit, so that, though a wet grinder, the life of the machine is not thereby shortened.

Notes from Great Britain.

The Markets.

A busy market seems to be assured until the end of the year, although it is impossible to ignore some dangerous features. Signs are not wanting that German exporters, in their extremity, may slaughter the market. Representatives of German steel making firms have recently been operating in the Midlands with some success. They have secured orders from numerous Midland sheet and bar firms for individual lots of 2000 and 3000 tons, in all totaling over 10,000 tons. The steel is of Siemens-Martin quality. German offers are also on hand for hematite pig iron, one shipment of 5000 tons having reached Wolverhampton last week. In Glasgow German steel plates are also being pushed. Merchants being oversold have had resort to the German product to cover their losses. Scottish makers are not disposed to meet their convenience, in view of present conditions. Nor do the Scottish makers attach much importance to these German plates. They rely upon the superior quality of their own makes. Notwithstanding the briskness of the market there is no doubt that prices are gradually falling. This is shown by the ascertainment of the various wages boards. Thus the North of England Wages Board announce that the net average price for the month of July and August was £6 11s. 4.18d., a decline of 6 shillings 8.31 pence, carrying a reduction of 5 per cent. in wages. The Midland Iron and Steel Wages Board have given out their average price for the same period as £6 17s. 0.48 d., a reduction in price of 2 shillings 2.07 pence. This also involves a reduction in wages of 5 per cent. The average, which is made up from 12 selected firms, is based on the following output:

	Tons.	£	s.	d.
Bars	16,178	6	18	6.40
Angles and tees.....	943	6	16	11.09
Plates and sheets.....	1,372	7	14	2.60
Hoop strip and miscellaneous.....	5,832	6	8	10.46

These figures indicate a decrease of 3857 tons. It is generally expected that the next ascertainment will show further reductions. This last wage reduction of 5 per cent. brings the actual wage decrease this year up to $27\frac{1}{2}$ per cent. In the Midlands the position of the unmarked bar makers is somewhat anomalous. They are desirous of raising prices, but it is not easy to do so in face of this wage decline. Their customers would not be slow to point this out. Notwithstanding the foregoing a spirit of hopefulness pervades the market. It is said that if only more coke were available more furnaces would be put into operation on the Northeast Coast. Personally, I do not think the facts quite bear out this contention. Orders are plentiful, but I do not observe any signs of an unusual rush. The following prices indicate how things stand: Coke, 16 shillings 6 pence, delivered at works; ferrosilicon, 82 shillings 6 pence; spiegeleisen, 85 shillings; Scotch pig, 53 shillings 11 pence; Cleveland, 45 shillings $5\frac{1}{2}$ pence; East Coast hematite, 60 shillings; West Coast hematite, 63 shillings; heavy steel rails, £5 5s.; light steel rails, £8 2s. 6d.; ship plates, £6 15s.; boiler plates, £7 10s.; bars, £6 5s.; marked bars, £8 10s.; hoops, £7 2s. 6d.; galvanized, corrugated sheets, £11 5s., f.o.b. Liverpool. The tin plate trade continues active, additional mills being put into operation. The resumption of work in America has, however, made the future very uncertain. Prices are quoted as follows: Bessemer tin plate bars, £5 5s.; Siemens, £5 2s. 6d.; tin plates, b.s.c., 15 shillings; Siemens (coke finish), 15 shillings 3 pence.

Shooting Good for This Trade.

The Birmingham Small Arms Company announce a trading profit for their financial year of \$420,000, the largest profit the company have ever made. A dividend of 20 per cent. was declared, but the profit would justify 40 per cent. It is, however, the settled policy of the Chamberlain companies to average out their dividends and strengthen their capital account as far as possible.

Russian Iron and Steel Trade.

An indication of how badly some Russian iron and steel concerns are doing is shown by the approaching suspension of the Don Donety Mining & Iron Company. This business has been financially supported by Belgian capital, which now mounts up to \$1,000,000. Bad management is ascribed, but it is difficult to see how things can be carried through successfully under the conditions prevailing in Russia. Those interested should not fail to secure a copy of the Foreign Office paper on the "Mineral and Metallurgical Industries of Russia" (miscellaneous series No. 555). In view of the persistent attempts made by the Russian Government to entice foreign capital, this valuable document should be filed for future use. I reproduce the following excerpts by way of showing vividly how really serious is the situation:

The money market has never been in so depressing or so deplorable a state, nor is there as yet any visible sign of amelioration, or even any appreciable glimmer of hope, save in the very gravity of the crisis itself, which in the long run will prove that superficial remedies, whether Government or otherwise, cannot definitely tide over the present position of affairs.

The feverish activity of 1896-98 could not last. The depreciating tendency beginning from the latter half of 1899 has continued almost uninterruptedly since. The word crisis, as applicable to almost every branch of industry, has long since become one of the most familiar headings of the Russian press. Disputes and discussions rage round causes and cures, but there is no question as to the main fact itself. Failure after failure of, at one time, promising concerns, some, indeed, before their initial plant was set up, the rapid reduction or suspension of dividends, the fall of industrial shares and depreciation of all values generally, the curtailment or cessation of production, the unexampled stringency and dearth of credit, and in general desolation and confusion on the Bourse, with the universal distrust prevailing in all industrial and financial circles, and especially among the wider public, bear witness to the grievous plight to which the high hopes of industrial expansion, entertained but a few years ago, have since been reduced and to the grave economic crisis from which the country is suffering.

Here, too, is an extract showing the influence of Government orders upon an unstable and unwisely directed metal industry:

The rise and extension of railway construction over vast regions, besides entailing a large demand for all descriptions of iron goods, opened out new districts, new means, and kindred industries. The demand for a time at least corresponded with the supply. One-owned and capitalist undertakings were converted into joint stock companies. Foreign capital and enterprise, allured by the attractions of the protective system and of high priced Government orders, streamed in from Belgium and France, and at first all went well, prices remaining so high that shares rapidly rose, and big gains were realized. Their papers were in full favor on the Bourses of Paris and Brussels, brilliant dividends of 40 to 50 per cent. maintaining the illusion. Companies rose up like mushrooms, attended with an abnormal Bourse and stock-jobbing fever. The rush of foreign capital brought in its train all the shadowy element of projectors, stock jobbers and brokers, with their multifarious manipulations, mineral specialists and company promoters, with their mines and ores all ready; in a word, all those miscellaneous intermediary agents who inveigled the willing but unwary public to buy shares not yet existing, or to embark their capital in ephemeral undertakings that were often so encumbered by the weight of preliminary and intermediary financial obligations as either to collapse before they started or to drag on to inevitable disaster.

With a diminution of State orders and at greatly reduced prices, confusion was, of course, made worse confounded. As showing how inefficiently the trade has been directed, I cannot help putting in this further extract:

Inefficient direction is another contributing cause of failure. It is notorious that the heads or directors of many of these undertakings were conspicuous for their want of the requisite special knowledge, or inner acquaintance with the particular conditions, local and general, and for entire ignorance of, or indifference to, the commonest laws of supply and demand, while most of them, from their numerous other avocations, were under the physical impossibility of giving any personal attention to the concerns whose organization, welfare and objects they were supposed to govern and control. Few of them, it is stated, ever once saw the works themselves, confining their labors to affixing their signatures to doubtful balance sheets.

The moral would seem to be that expansion without economic backing is worse than useless.

Prospects in India.

I have repeatedly drawn attention to the possibilities of trade in India. Another proof comes in the statement that the representatives of two more German firms have started for India to try and capture some large orders for rails and rolling stock which the Indian railway

authorities will shortly be giving out. Of course this is a speculative business venture, and doubtless trade depression at home has been a factor in coming to this decision. At the same time I do not think these gentlemen are likely to come back empty handed. The growth and development of India should be closely watched. In the near future it is bound to become a most valuable market.

S. G. H.

The Rolling Mill Company of America.

George J. Humbert, formerly with the Humbert Works of the American Tin Plate Company, at Connellsville, Pa., has succeeded in interesting some New York capitalists in South Connellsville as a manufacturing site, and as a consequence the Rolling Mill Company of America have been chartered under the laws of the State of New Jersey for the purpose of erecting and operating steel and iron rolling mills there. The plant when completed will consist of 20 sheet mills, open hearth steel plant and modern sheet bar mill, with a view of being independent of the market in the matter of bars from which the sheets are rolled, and will employ upward of 1200 men. The plans are prepared and bids are being received this week for the buildings and machinery. The latter will be completed at once for ten mills, and ten more will be added later at the convenience of the company. The plant will cost about \$500,000 when completed. The main building will be 110 x 400 feet, with water house and storehouse 50 x 250 feet and boiler house 45 x 80 feet. The buildings will be of steel and brick, and the whole plant of modern construction. The power will be furnished by two engines of 36-inch cylinder and 60-inch stroke, with fly wheels 34 feet in diameter and weighing 75 tons. These engines will be capable of developing 1000 horse-power each. A 15-ton electric traveling crane of 50-foot span will traverse the entire length of the main building. Two large picklers of the most modern pattern will be used in treating the plates. The large engines mentioned will drive all the heavy machinery, but the small machinery will be driven by electricity. The plant will be located just north of the plant of the Steel & Iron Aluminum Coating Company. It will occupy about 10 acres and will be completed and in operation in from six to eight months.

Production of Structural Shapes in 1900.

The production of iron and steel structural shapes in the United States in 1900 has been ascertained by the American Iron and Steel Association. These statistics embrace the production of beams, beam girders, zee bars, tees, channels, angles and other structural forms, but they do not include plate girders made from plates. Plates are provided for under other classifications, and under the general statistics of plates are included all plates cut to specifications. Nearly all the structural shapes and plates used for structural purposes are made of steel. The total production of structural shapes in 1899 was 850,376 tons, and in 1900 it was 815,161 tons. The total production of strictly structural forms in 1899 and 1900 by States was as follows:

States.—Gross tons.	1899.	1900.
New England, New York and New Jersey.	29,604	34,242
Pennsylvania	791,470	759,712
Kentucky and Alabama.....	304
Ohio	20,941	12,344
Colorado and California.....	8,057	8,863
Totals	850,376	815,161

The decreased production of structural shapes in 1900 as compared with 1899 was 35,215 gross tons, or over 4 per cent. Pennsylvania made over 93 per cent. of the total production in 1900, New Jersey over 4 per cent. and Ohio over 1.5 per cent. No other State made 1 per cent.

The Kiskiminetas Valley Mills.—The Kiskiminetas Valley Mills of the American Sheet Steel Company embrace the Vandergrift works, at Vandergrift, containing 21 mills, to which eight will be added; the Hyde Park works, with five mills; the Saltsburg works, with four mills; the Leechburg plant, with ten mills, and the

Apollo works, with six mills, a total of 46 mills, which will soon be increased to 54. All these mills are in charge of S. A. Davis, division superintendent, who makes his headquarters at Vandergrift. Some remarkable records have been made in these various mills, both as regards tonnage produced and economy in operation. On Monday, October 21, the mills named above turned out 631 tons of marketable sheets. This is certainly a very creditable record and reflects much credit on the efficient management of Mr. Davis.

The Cleveland Drill Socket.

In the usual form of socket the drift bears on the corner of the drill tang, and it is necessary to hold the drift while it is being struck. In the new socket made by the Cleveland Twist Drill Company of Cleveland, the upper part of the opening is formed with a double taper to



THE CLEVELAND DRILL SOCKET.

correspond with the taper of the drift. It is not necessary to hold the drift when struck, as it will not jump out under a blow.

Naval Architects' and Marine Engineers' Convention.

The ninth general meeting of the Society of Naval Architects and Marine Engineers will be held at the house of the American Society of Mechanical Engineers, New York, November 14 and 15. The following papers will be read: "Trial of Speed Between the Steamers 'City of Erie' and 'Tashmoo,'" by Frank E. Kirby; "Effect of Variation of Dimensions on the Stresses in a Ship's Structure," by Prof. H. C. Sadler; "Graphic Calculations of the Stability of Ships," by Prof. M. H. Bauer; "Power Consumed in Propelling the Whitehead Torpedo at Various Speeds," by Frank M. Leavitt; "A Brief Comparison of Recent Battle Ship Designs," by Naval Constructor H. G. Gillmor, U. S. N.; "Changes in Torpedo Boat Designs," by Charles P. Wetherbee; "Late Developments in Armor and Ordnance," by J. F. Meigs; "Recent Experiments in Attacking Armor with High Explosive Shells," by Capt. E. B. Babbitt, U. S. A.; "Some Notes on Tidal Corrections," by E. A. Stevens; "Side Launch of Torpedo Boats and Torpedo Boat De-

stroyers," by Assistant Naval Constructor Wm. G. Groesbeck, U. S. N.

There will also be presented two prize competition papers on "Balancing Marine Engines."

Central American Notes.

TAPACHULA, MEXICO, October 1, 1901.—A convention which has much more to do with the commerce of the three Americas than would seem at first glance is soon to meet at the capital of Mexico—the Pan-American Congress. Arbitration and other political questions will be treated also, but our people, as well as the Latin Americans, should take a keen interest in the projected international banks, new lines of communication, bases for reciprocity treaties with our neighbors, founded on those made by Mr. Blaine, as a result of the first Pan-American Congress, and which could have done untold good to all the parties concerned had they been given the time sufficient for a fair trial. Better, in fact, thorough knowledge of one another is the true beginning of all commerce with our 16 sister republics. Much may be done toward this by our representatives at this congress in Mexico. One of these, Hon. Wm. T. Buchanan, we know of through Dr. Chandler, who referred to him as eminently fit for such a position. Mr. Buchanan speaks and writes Spanish with remarkable facility, he has been United States Minister to the Argentine Republic for a number of years, and while there served to avert war between Argentina and Chile by his arbitration of their long standing boundary question. Furthermore, he has had exceptional opportunities to study the commercial possibilities, the character, manners and laws of the Latin Americans, the Pan-American Exposition (of which he is director-general) helping not a little toward this end. How much such a man means in a congress of the nations can only be understood when we recall the fact that Spanish Americans carry sentiment even into their everyday business affairs. One who sympathizes with them, who speak their own language and who knows their peculiar customs is certainly fitted to be of vast use in this important congress, both to our Government and to our commercial interests.

The steamers of the Consolidated Sud-Americana running between Valparaiso, Chile, and San Francisco, Cal., have made a change in their schedule, thus gaining at least a week in the time between Panama and San Francisco. The ports they touch at will be La Union, Acapulco, San Jose, Ocosingo, Manzanilla, San Blas and Mazatlan. A branch line of steamers has been put on to carry all coasting trade, transshipping all American and European freight at Panama.

Another increase in Colombian taxes has been announced. All exports of mineral of whatever kind pay \$20 per ton, rubber and tobacco, \$5 per hundred, and cotton, \$2 per hundred.

The San Francisco (Nicaragua) gold mines, owned in London and working some 300 to 400 men, have closed down. New machinery for the Libertad mines, including 120 stamps, is being erected.

The railroad line across Honduras, in which the Astors and other New York capitalists are interested, is conducting several surveys on the Atlantic and the Pacific coasts. There is some possibility that two ports will be used on the Atlantic, Puerto Cortez and Puerto Caballo.

The Durham Iron Works Sold.—Cooper, Hewitt & Co. have sold to John Jamison and J. G. Baker of the Quakertown & Eastern Railroad Company, Doylestown, Pa., the Durham Iron Works of Riegelsville, Pa. A charter has been applied for and a new company will be organized. The property consists of a blast furnace, which has been in operation for some time past. The property is one of the oldest in the country. It originally belonged to William and John Penn, and iron was made at Durham in the early part of the eighteenth century. For nearly 100 years the Durham boats formed the only means of communication on the river Delaware. Gen. Daniel Morgan, who distinguished himself in the Revolutionary War by his operations in South Carolina,

was the founder of the Durham works, and it has graduated many eminent ironmasters, among whom is B. F. Fackenthal, Jr., the president of the Thomas Iron Company of Hokendauqua, Pa.

Impressions During a European Trip

Archer Brown of Rogers, Brown & Co., pig iron merchants, and who is closely connected with the ownership and management of the Tonawanda, Punxutawny, Iroquois furnace plants and with the Empire Iron & Steel Company has recently returned from a tour of several months in Europe. Some of the observations which he made during this visit he has communicated in a recent conversation with a representative of *The Iron Age*.

A Change in Sentiment Toward the United States.

I visited principally the northern countries of Europe, dividing three months between Russia, the Scandinavian countries, Holland and Northern Germany. I was struck everywhere with the change in sentiment toward America that had taken place since my last visit, which was just prior to the Spanish-American War. Two things have happened since then which made a profound impression throughout the Continent and in Great Britain. The first was the neat and rapid way in which we finished the Spaniards. Second was the demonstration in the past three years of our ability to take their markets in certain manufactured lines if we desired to do so. In 1897 I found that German, French and even English iron manufacturers treated the growing claims of our country to superiority in methods as a sort of joke; incredulity was general. Now it is hard to get up a story of wonderful achievements on this side that is not promptly believed. In 1897 Europe looked on America mainly as addicted to trade and agriculture, but with no war spirit and no resources of army or navy to match those of the military powers. Now the impression is general that we can do anything we want to in war as well as in the industrial fight. In 1897 there were not many articles of American manufacture to be met with in English and Continental markets. When such articles were offered to consumers it was with some apology on the score of quality, but with the argument that they were cheaper. Now you see in the leading shops of Berlin, St. Petersburg and London, American shoes, New York hats and other articles, presented usually as higher priced but of superior quality. The trade in all these lines is growing. A German showed me a pair of American shoes he was wearing which he said was the most satisfactory he had ever had. In machinery lines the American stamp greets one everywhere. In Moscow, which is a great market for machinery, I saw more American goods than all others put together. Agricultural machinery, mowers, reapers, plows, &c., have almost completely taken Great Britain, the Continent, and particularly Russia. The Russian Government seems to realize that the development of its vast grain growing fields depends more on American implement shops than any other one thing, and it encourages the importation by practically doing away with duties.

The Battle for Supremacy.

What interests an American business man most of all is to study the varying phases of the battle that is going on for the industrial supremacy of the world. This is clearly narrowed to three nations, Great Britain, Germany and the United States. A year ago it looked as though this country would take the business of the world in iron, steel and other important lines. But since then several things have happened. The renewal of the great wave of prosperity at home which was threatened in 1900 has been coincident with the money panic and industrial depression in Germany. England has been passing through a scare that checked industries, but has not reached the proportions of a panic. The prices of iron, however, have dropped 33 per cent., and production has fallen to the lowest figures recorded for years. The very natural result has followed. Both England and Germany have resumed control of their own mar-

kets, and are reaching out for export trade. In nearly all markets of the world the Germans are now underbidding us, and the English are a close second. The Americans seem able to hold their trade in certain lines owing to the superiority of their goods. These are such lines as agricultural implements, sewing machines, small machinery, &c. It seems recognized, however, that these conditions are but temporary and due to more or less artificial causes. It is admitted that the United States is very much in the three cornered fight for control of the world's trade and in the long run will win out. There is, indeed, a sort of hopeless tone in English and Continental papers and in the talk of their business men on this subject. They seem to think that there is no use of fighting the Yankee with the ordinary weapons of labor, skill and capital, but that some higher barrier must be built up to protect even the home trade.

The German Tariff.

The Agrarian party in Germany has seized this situation to force upon the country a new and much higher tariff. The bill has not yet been presented to the Reichstag, but has been formulated, and the Government is committed to it. It is apparently, therefore, bound to go through at the coming session. The measure is what might be termed a "corker." It provides for a general advance of from 50 to 300 per cent. on food materials and a large advance on manufactured articles. It has aroused a whirl of protest, and naturally will have fierce opposition from manufacturing interests, for it is recognized that it would be the death knell of German manufacturers, who could not hope to compete outside of their own empire with manufacturers of other nations whose workmen enjoy the benefit of low cost food products. The Berlin *Tageblatt* declares that such a tariff would "revolutionize the whole economic, industrial and commercial status of the German people, drive a large proportion of the working classes back to a diet of black bread and potatoes, diminish the productive strength of the nation and its consequent power of competition, and by provoking reprisals from agricultural nations like Argentina, Austria and Russia and the United States imperil the foreign markets for German manufactures."

Great Britain's Troubles.

Turning to Great Britain, the industries there have troubles of their own. The chief one is the Boer War, which has cost the British nation already three times as much as the war against American independence, and more than any previous war in British history. The facts are sorely felt in increased taxation, in disturbance of finances, and in taking away a quarter of a million young men from the nation. The public expected to have done with it a year ago, but the prospect now is for an indefinite continuance. A well informed army man with whom I talked in London, who had been through a campaign in South Africa, said the feeling in army circles was that it would take at least two years to finish the job, and perhaps double the present enormous bill of expenses which the nation would have to meet. England has two other handicaps in the fight. One is the complete ascendancy of trade unions, which stifles ambition among the workmen and binds employers hand and foot. The other is more deep rooted than the Boer War or trade unions. It is the rock ribbed conservatism of the British, which, in spite of all the talk of public speakers and newspapers, is satisfied with itself and with the achievements of a generation ago. This stands in the way of improvements to plant that are imperatively needed. The iron and steel industries are feeling it, the railroads are feeling it, and in nearly every line of manufacture it is felt. It is not surprising, therefore, to see Great Britain drop back year by year in her output of iron, while the United States and Germany forge ahead.

Russia in the Industrial World.

Russia is the most misunderstood country in the world. The empire is so vast, the population so great, and its resources so enormous that it is generally supposed to be the peril of Europe. Back of this is ambitious and farsighted statesmanship. But Russia in politics and Russia in the industrial world are two very

different propositions. I was fortunate in gathering in a few weeks' stay results of the experience of English and American residents who had studied the problems at close range for many years. There are two classes in Russia, the educated and ignorant. The former constitute about 8 per cent., and the latter about 92 per cent. There is no intermediate class. The educated class is composed mainly of the nobility, which consists almost wholly of the military and bureau aristocracy. It affects to look down upon business. It occasionally takes a hand in the organization or management of companies, but usually with disastrous results. Remarks one hears from German, French and English speaking business men who have had experience with Russians in business ventures would hardly do to print. The impression is strong that the standard of commercial honor is one of the lowest in Europe—which is saying a great deal. The masses of people, on the other hand, though physically robust, are wholly void of ambition, and seem to be without either the desire for education or the means to secure it. There is a poor prospect, therefore, for any industrial development in Russia for the next two or three generations. The French have put about \$400,000,000 into Russian enterprises in the past few years and have lost half of it, and are reported to be sick of the experiment. Even the American companies who have had valuable concessions and contracts from the Russian Government have had their experiences when the local managements have had to come in contact with the Russian police and other methods. Russia needs, above all things, more railroads. The terrible famine which is approaching in some districts could be easily obviated if there was means of transportation for the plenty that is to be found in other districts. The Government is building roads, but progress is very slow because of lack of means.

The Shipping Trade.

The slack shipping trade is one of the troubles of England and Germany just now. I saw on the river Maas, at Rotterdam, scores of Rhine boats tied up because of the depression in Rhenish industries. Tramp steamers can find few cargoes at rates that will yield cost. The importation of grain and provisions from America is for the time reduced, though Continental countries must have as much of our wheat and pork in the next year as in any previous year. The falling off of heavy iron and steel traffic has also cut a big figure in the freight bills. In spite of this condition of things the Clyde yards are full of orders for new steamers. The explanation given by a prominent shipper was that in the boom in freights of the past two years shipowners were able to sell out their old boats and thought it best to put the proceeds into new and up to date ships which could in times of close competition drive out the older craft. There seems to be no expectation of an early revival of the shipping trade.

The Rapid Growth of Cities.

Another feature that strikes Americans is the rapid growth of the cities, particularly the Continental capitals. Berlin has jumped from 500,000, in 1880, to 2,000,000 population. Munich, Dresden, Frankfurt, Cologne, Leipzig and other German cities have all had their booms and have expanded enormously. Even in Sweden, Denmark and Norway the same thing is seen. The building of new structures has helped the home labor markets to the point that emigration to the United States is almost entirely suspended. One is led to wonder whether this concentration of population and wealth in cities can go on without disturbance of the equilibrium. It is likely to have a check in Germany at least.

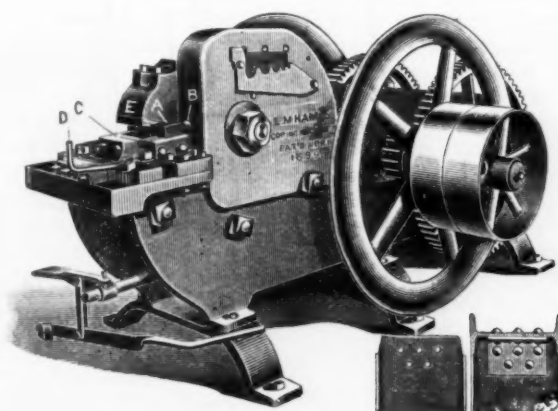
Recovery in Germany.

Germany is the danger spot, and all eyes are turned toward it. I was interested to learn the best opinion as to prospect for recovery. This did not seem to be hopeful. For ten years the development has been forced. The structure has been built something like the German army, with military precision, and from the Emperor down there has been a determination to make Germany great. The structure is an imposing one, but it has been artificially built. The system of syndicates, the most

drastic in the world, has gradually lifted prices on iron, steel and coal and, not content with dealing with the present, has projected business into the future. The banks have supported industrial ventures to an extent unknown in any other country, and now that the reaction comes there is hopeless confusion. The adjustment to a much lower level of prices is going on gradually, but it leaves many wrecks by the way. It will be one or two years before it can be completed.

The Ham Coping Machine.

The coping machine built by L. M. Ham & Co., 152 Portland street, Boston, is designed for quickly cutting off or shaping the ends of structural iron or steel beams, particularly those having double flanges at each edge. In steel frame structures it is frequently necessary to join these beams together at right angles, or otherwise, and by the use of this machine the parts may be expeditiously shaped and cut to suit the plans. The machine has a vibrating cutting head or jaw, with which two stationary dies, one on each side, co-operate. There is also a front die made movable in the line of the front of the cutting head, so as to open a space at the corner, between the front and side dies, to receive the projecting flange of



THE HAM COPING MACHINE.

the beam. A rack and pinion, with a lever for moving the front die, is provided, also stout insertible blocks of various heights for the edge of the flange of the beam to rest on. In addition to this, gauges adjustable by a screw are placed at the sides of the cutting head to be adjusted to the varying widths of the beam webs.

The following description of the method of operating the machine will aid in understanding its design. By means of the screws provided the gauges B E are set to the proper depth for the beam that is to be coped. The beam is then placed on its edge, under and close to the knife A, and also close to the gauge B. The machine is set in motion by the foot lever and one flange cut off. The beam is then turned over and the other flange cut off. By means of the crank D the knife C is drawn to one side and a rest that is provided for each beam to be cut is placed in a hole in the bed. The beam is then turned down under the knife, swung to the proper angle and the web cut off. The beam is turned over and the operation repeated on the other side.

Press reports state that negotiations are under way for the organization of the White Mountain Paper Company. Although in somewhat of an embryotic state, it is believed in well informed circles that the project will eventually be consummated. While arrangements for the capitalization of the concern have not been positively settled, it is said that the total capital will probably be \$25,000,000, divided into \$10,000,000 first mortgage sinking fund 30-year gold bonds, \$5,000,000 7 per cent. cumulative preferred stock, and \$10,000,000 common stock. A sufficient amount of the bonds for the construction of the plant will be offered to the public, but it is understood that the common and preferred stock will be taken by those engaged in promoting the

corporation. It is understood that William B. Plunkett of Adams, Mass., is to be president. J. C. Morgan, formerly of the Niagara Falls Paper Company, is the promoter of the new concern. William Whiting, president of the Whiting Paper Company, Holyoke, Mass., who has been mentioned as among those interested in the enterprise, advises us that he has not yet decided to have any interest in the new company.

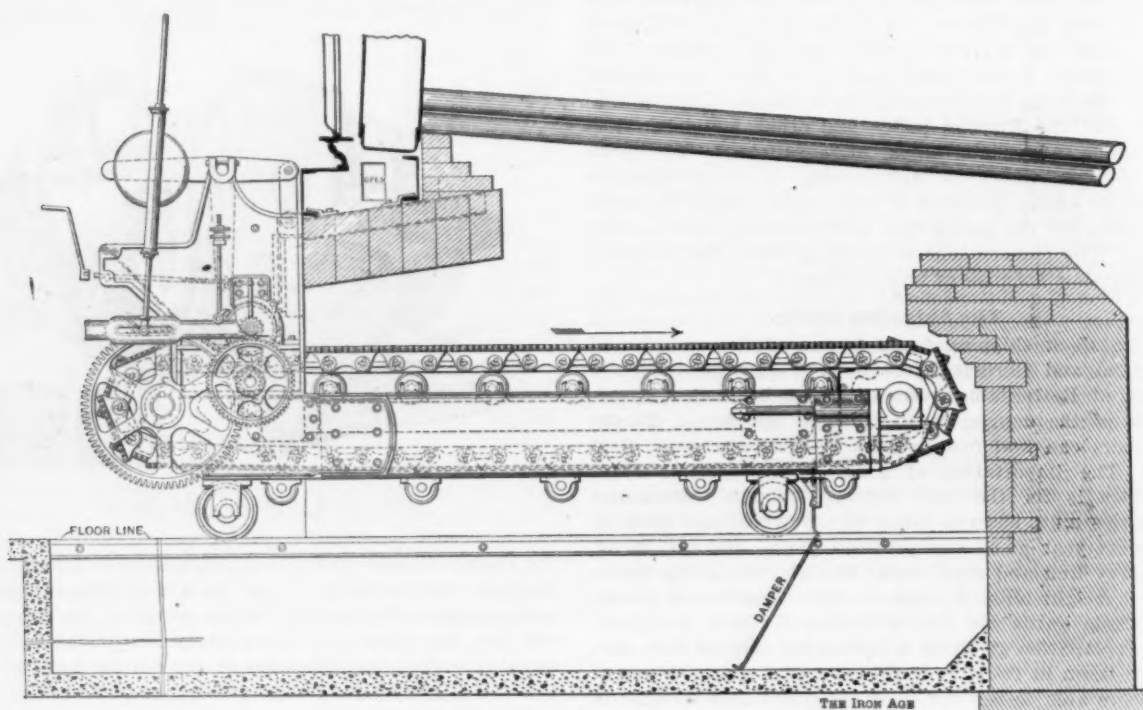
Scrap Aluminum.

There seems to be considerable misunderstanding among metal dealers and others less directly connected with the aluminum trade as regards the matter of the value of aluminum scrap, says the *Aluminum World*. The price for aluminum scrap is, of course, set by the best informed buyers, and is always just sufficiently below the price of new metal to leave margin for remelting, cost of selling, and profit. The recent average market price paid for aluminum scrap by those dealers who are doing a considerable business in the light metal has been from 24 cents to 25 cents per pound, and as high as

The Green Traveling Link Grate.

In the mechanical stoker built by the Green Engineering Company, 517 Western Union Building, Chicago, wrought iron has replaced the cast iron girders of the frame, which have been removed from the direct effects of the furnace fire. Long thin links with increased depth have been substituted, and increased and uniform air space has been provided. This increased length of the links affords a greater overhang so as to shear any clinker which during the travel of the grate may have lodged against the bridge wall, while at the same time it completely clears the ash from all the air spaces of the chain at each turn around the rear sprockets. The frame is well braced and stiffened to meet the requirements of hard service, and in all stokers exceeding 7 feet in width there is provided a center girder support for the upper roll shafts to prevent deflection.

The driving mechanism, Fig. 1, consisting of ratchet and pawls and gear train, rests in a strong frame and may be adjusted within a wide range of travel. Power is obtained from eccentrics carried by a shaft placed along the front of a battery of boilers. The eccentric



Side Elevation.

THE GREEN TRAVELING LINK GRATE.

26 cents. While this price has eased a trifle lately, scrap dealers who do not handle aluminum regularly, but who merely pick up a stray lot now and then, can hardly be considered an authority on the market quotation for aluminum scrap. The above quotations apply to pure aluminum scrap only, and not to alloyed or otherwise second-grade metal.

The Riter-Conley Steel Barge Plant.—The report that the Riter-Conley Mfg. Company of Pittsburgh, builders of heavy plate and structural iron work, would erect a new plant at Haysville, Pa., to build steel barges, is incorrect. This concern will build at Leetsdale, about 15 miles from Pittsburgh, a works for the manufacture of steel barges. Plans for this new plant are now being prepared, and it will be on a very extensive scale. The Riter-Conley Mfg. Company will continue to operate their structural iron works on Water street, Pittsburgh, and also the Preeble avenue works in lower Allegheny.

J. B. Blettner & Co. of Cincinnati, Ohio, are finding a growing trade with Mexico in general machinery, and lately have been making quite a number of shipments to Cuba.

connections are made through a long, sensitive relief spring which prevents undue strain upon the gear train or chain in case of accident or stoppage. Any link can be removed and replaced without breaking the chain, removing the bars, or interfering with the service. The clips forming the chain are slotted. The bars are oval in shape and when engaged by the links are locked and held by the binding links at each end. The regulating feed gate is especially adapted for hard firing, being provided with a tile lining so designed that each tile may be readily replaced independently of the others. Removable shields are placed so as to form an air chamber with the feed regulating gate, and thus prevent the fire's eating back into the fuel magazine.

A ventilating coking breast insures uniform ignition and uniform finish of combustion. The blocks forming this breast are so supported as to remove all strain due to expansion. Any single block can be replaced without disturbing the others.

The Mosler Safe & Lock Company of Hamilton, Ohio, have recently been experimenting with aluminum in the manufacture of sample safes, and they have placed an order for twelve sets of the castings for the same with the M. & M. Machine Company of Cincinnati.

Worcester Industries.

WORCESTER, MASS., October 28, 1901.—The condition of business among the iron and steel industries of Worcester and Central Massachusetts continues to be excellent. The extraordinary summer, with its uninterrupted rush of orders, which has characterized the wire business, is supplemented by an autumn of even better times, not only with the big plants of the Washburn & Moen department of the American Steel & Wire Company, but with the independent plants, including the Morgan Spring Company, Wright & Colton Wire Cloth Company, Spencer Wire Company and Clinton Wire Cloth Company. There was nearly \$1,400,000 of business done by the Washburn & Moen department in August. The record for the month has been followed by an even better September, and October so far shows a still further increase. Take, for instance, the spring department. One morning alone, a Monday, brought orders for more than 200 tons of springs. This department is an important one, and one of the reasons is a line of customers who each takes large amounts per

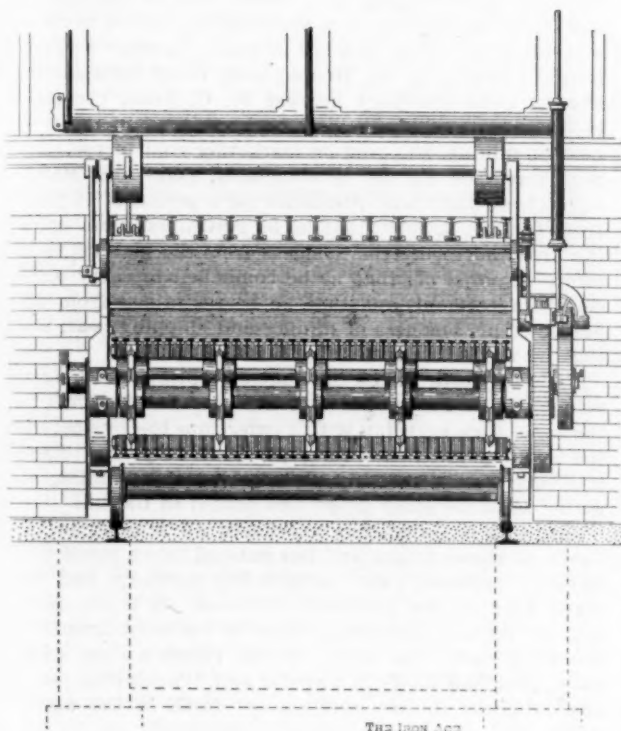


Fig. 2.—Front Elevation.

THE GREEN TRAVELING LINK GRATE.

season. The Westinghouse Air Brake Company are such a customer and buy nearly 1000 tons of springs alone from the Worcester plant, most of them of very large sizes and of great accuracy of workmanship.

The Washburn & Moen department has ordered a battery of nine tubular boilers of the Stewart Boiler Works of Worcester, to replace the old tube boilers of the same type at the south works rod mill. They will be 72 inches in diameter and 20 feet long, with a horsepower of 150 each. The department has been installing water tube boilers of late. All the boilers of the new rod and blooming mills are of that type, but it was more economical in the present instance to put in tubular boilers, because they will fit the spaces occupied by the boilers they will replace.

The new department for the manufacture of paper insulated wire cable has been started on a commercial scale and a large business is expected for it.

The wire people, including the Wire Goods Company, National Mfg. Company, Hamblin & Russell Mfg. Company and the Parker Wire Goods Company, are not so busy as they would like to be, though there is nothing especially dull about their trade. They constitute quite an important part of the wire business of Worcester, for they have not only a very large output, but are customers,

with one exception, of local wire manufacturers. The exception is the Wire Goods Company, the largest of them all, who are very closely affiliated with the Washburn Wire Company of New York and Providence, R. I., of whom Charles G. Washburn of Worcester is president, which office he also holds in the Wire Goods Company. The Washburn Wire Company have taken a number of important men from the Washburn & Moen department, among them Cornelius E. Terry, head of the flat wire department, who is now located at the New York plant of the Washburn Wire Company. As one of the leading flat wire men in the country Mr. Terry has been valuable in building up that department of the new company, and the Washburn & Moen department has suffered a little thereby.

The first artificial corundum from the Niagara plant of the Norton Emery Wheel Company has arrived in Worcester and is being converted into wheels at the company's factory at Barber's Crossing. The new plant is an entire success, it is said, and the quality of its product is even superior to the natural corundum in that it is of uniform grade, which is not true of the natural product.

The Crompton & Knowles Loom Works made formal announcement recently that they would concentrate their business at the Grand street plant, which has been foreshadowed in *The Iron Age*. This means the building of extensive additions, including machine shops and foundry, besides the big buildings recently purchased from the Sullivan Forehand Estate, one of which was formerly occupied by the Forehand Arms Company and the other still occupied under lease by the Reed & Prince Mfg. Company, manufacturers of machine screws, &c. The concentration also means the abandonment of the Crompton department's buildings on Green street, which are not economical to operate because there is no railroad connection, making a good deal of expensive hauling necessary. The Gilbert Loom Works on Union street, now a department of the Crompton & Knowles Company, and the Cambridge street plant, which is located in a leased building, will also go to Grand street. As for the Providence, R. I., works of the company, it is not given out as to whether they will come to Worcester immediately, but it is understood that their ultimate fate is to come here.

All the loom builders of Central Massachusetts are very busy. The works of the Draper Machine Company at Hopedale are rushed with orders, while the Crompton & Knowles works are running full time and with a full force of men, more than 1000 in all. The Drapers are rushing their automatic plain looms, while the Crompton & Knowles people are paying more attention to their fancy looms. Both have recently made extensive improvements to their big machine shops and foundries.

The announcement of the reopening of the American Wheelock Engine Company's plant on Southgate for the manufacture of the Diesel combustion engine has caused a good deal of discussion among Worcester manufacturers. The owners of the property are the International Power Company, who bought out the American Wheelock Engine Company, removed the business to Providence, R. I., and started in the manufacture of the Hoadley compressed air motor in the Worcester plant. Great plans were made for the future of the Worcester plant, but they all came to nothing, and the experimenting on the motor was stopped here and continued in New York, where one of the crosstown lines had been equipped with this motive power. The Worcester plant was shut down and afterward leased to the Morgan Construction Company for a setting up shop and testing department. The lease has expired and the Morgan Company have given notice to vacate the premises. Then came the announcement that the plant had been sold to a new company, who would manufacture the Diesel engine, and later that the International Power Company would themselves conduct the manufacturing end of the business and a new corporation, to be known as the American Diesel Engine Company, would put the engine on the market. This statement came from Joseph H. Hoadley, president of the International Power Company. He gave out that Adolphus Busch, president of the An-

heuser-Busch Company of St. Louis, is president of the American Diesel Engine Company and that Senator Chauncey M. Depew is one of the directors. Mr. Hoadley stated that it is the plan of his company to immediately greatly enlarge the present Southgate street plant, though the buildings, of modern construction, now cover 1 acre of land. There is another acre available for building and yard purposes.

A number of the largest of Worcester iron and steel industries will be affected by the change in grade of the Boston & Albany Railroad and Providence & Worcester and Norwich & Worcester divisions of the New York, New Haven & Hartford Railroad, in the abolishing of the grade crossings of the southern section of the city. The railroad tracks will be raised from 6 to 14 feet, which will mean expensive structural work for side tracks at the plants along the line of the railroads. Among those affected are the Rice, Barton & Fales Machine & Iron Company, Crompton & Knowles Loom Works, Arcade Malleable Iron Works, Allen Boiler Works (William Allen & Sons Company) and the Bradley Car Company.

The Norton Emery Wheel Company recently shipped one of their new Norton plain grinders to Manchester, England. Six others of the great machines, weighing 15,000 pounds each, have been shipped within a short time to American manufacturers.

George I. Rockwood of Worcester, mechanical engineer, has sold his patented automatic water feed to the Mobile Company of America of Poughkeepsie, N. Y. It will be applied to the company's late models of automobiles. The water feed, already described in *The Iron Age*, supplies the boiler without attention from the chauffeur, a trap working automatically to maintain the level of the water within a very narrow compass.

The Pennsylvania Steel Company have disposed of 1600 tons of 60-foot 90-pound half grooved rail, rejected by the Worcester Consolidated Street Railway Company, to the Massachusetts Electric Company, who control the street railways of Northeastern Massachusetts. The rails had a slight taper at one end and it has been necessary to cut off about 6 inches of steel to make them perfect.

The Wright & Colton Wire Cloth Company have shipped several orders of wire cloth to Armenia. It replaces primitive methods of freeing grains of foreign substances. About a dozen sizes of mesh are used in the new Armenian process. Some of it is plain wire cloth; the remainder is galvanized. A Worcester Armenian saw the advantage which wire cloth would give his countrymen at home in harvesting their grain and has succeeded in establishing quite a market for wire cloth there.

A good deal of new building has been done this summer by Worcester steel and iron men. The Morgan Construction Company are about ready to move into their large new shops, which are additions to the company's works on Lincoln street. Wyman & Gordon, drop forgings, have doubled their plant on Bradley street. Large additions have been made to the works of the Harrington & Richardson Arms Company, the Plunger Elevator Company and F. E. Reed Company. The latter company have put in the foundations for a big factory to be completed in the spring. The Coes Wrench Company have their new buildings, in which will be located their new wrench department, well on toward completion. There are a number of other improvements of less importance. The sum total is a very considerable addition to the efficiency and productiveness of the trade in Worcester.

The buildings on the property of the Queen City Construction Company on Bloomingdale road, formerly known as the Worcester Steel Works, have been completely torn down, with the exception of the modern shop building formerly occupied by the now defunct Worcester Cycle Mfg. Company. The iron and steel in the structure was bought by a New York concern as junk. The Queen City Construction Company, a Pennsylvania corporation, in whose name the property now stands, have given no intimation of what their purpose was in purchasing.

There are more than 5 acres of land next door to the Boston & Albany freight yards, and with spur track connections. It has finally got into the hands of the Queen City Construction Company, a corporation organized to build a gas plant at Buffalo, N. Y., now completed, and rumor has connected them with all sorts of enterprises, including a pipe line for gas to Boston, which arises from the fact that J. Edward Addicks was the chief stockholder when the corporation were doing business as gas plant builders.

Albert W. Gifford of the Worcester Machine Screw Company is to build a large building for general manufacturing purposes at the corner of Beacon and Jackson streets. It will be about 100 x 75 feet on the ground, three stories high, and of brick. There is a large demand in Worcester for shop room of limited area for steel and iron business, and Mr. Gifford's purpose is to rent the building for such purposes.

E. D.

Validity of an Agreement Not to Re-enter a Business.

Probably the first test of the legal standing of a contract not to engage in a certain line of business on the selling of property to a combination will be made as a result of the filing of a bill in equity in court at Pittsburgh recently by the Monongahela River Consolidated Coal & Coke Company against W. C. Jutte, the court being asked to restrain him from engaging in the business of mining, shipping or marketing coal in the territory traversed by the Monongahela, Ohio and Mississippi rivers and their tributaries for a period of 10 years from October 2, 1899; that he be restrained from entering or withdrawing the business from the plaintiff heretofore disposed of; that he be compelled to carry out a certain agreement, and that he be restrained from disposing of his business of mining and shipping coal; also that he render an accounting.

It is set forth in the bill that on April 8, 1899, Jutte sold to J. B. Finley his coal business for \$862,580, at the same time agreeing not to enter into the business in the territory mentioned for a period of 10 years. These interests were ultimately absorbed by the plaintiff, together with the other properties named in the bill.

Jutte, it is stated, has purchased an interest in the Castle Shannon mines, and has entered into a retail coal trade in Pittsburgh and surrounding territory, and has taken part of the plaintiff's business. It is set forth that he has also purchased mines in Forward township, operating under the name of the People's Coal Company; also coal lands in Fayette and Washington counties, adjacent to the territory set forth in the agreement.

It is averred he and his associates have obtained a charter for a corporation known as the C. Jutte Company, for the purpose of mining and shipping coal contrary to the agreement, and that he has obtained a charter for the Coal Bluff Coal Company. In conclusion it is alleged Jutte has shipped coal to the plaintiff's customers in the lower rivers, all of which is contrary to his agreement.

On the organization of the American Tin Plate Company and the American Sheet Steel Company agreements were entered into with the manufacturers of tin plate and sheet mill machinery, which guaranteed to the latter a certain amount of business, in consideration of which no mill equipment was to be sold by them to independent concerns. These agreements, it is understood, will now be canceled by the United States Steel Corporation, and no more subsidies will be paid to the machinery and roll manufacturers. The only effect of the arrangement was to encourage the starting up of new foundry and machinery plants, so that the agreement proved to be of little value to either party.

The 50,000 mark has been passed by the Pressed Steel Car Company of Pittsburgh, in the manufacture of pressed steel cars. The output of cars by this concern up to October 24 aggregated 50,091, enough to make a train of steel equipment over 300 miles long.

Russo-American Railways in Asia.

BY ALEXANDER HUME FORD.

If the plans now projected by Russia are carried to completion more than \$100,000,000 will be spent in Manchuria rebuilding the Chinese Eastern Railway and constructing hundreds of miles of new lines. Large orders have come to this country from Port Arthur, and the indications are that Russia will profit by the lesson of last year and rush her Far Eastern railways to rapid completion.

The Chinese Eastern being practically an American built and equipped railway, we may confidently expect to construct the new lines, now being surveyed through Manchuria. The most important of these is undoubtedly the proposed Onon, Aigun Iman Air Line, which is practically a resumption of the abandoned Amour River route of the Trans-Siberian Railway. The troubles at Aigun, opposite Blagoveschinsk, demonstrated the weakness of Russia's military occupation. Troops in the Amour district were segregated, while the Russian railway through Manchuria was being destroyed by the Chinese. The new line will leave the Trans-Siberian at Onon, on the Shilka River, just above the headwaters of navigation, and taking a direct easterly route through the mountains of Western Manchuria, pass through Aigun, touching the banks of the Amour, then proceeding in an air line to Iman on the Usury River, 200 miles north of Vladivostok. This is the city built on the Usury Railway at the head of navigation, from which to ship the American materials for the building of the Chinese Eastern Railway, steel barges being dispatched almost daily to the various points on the railway intersected by the Sungari River. Both this river and the Amour will again be used to render similar services to the new railway, which, by the way, cuts off more than 1000 miles from the round about route of the Trans-Siberian Railway, as first surveyed along the winding banks of the Amour.

Having journeyed between Port Arthur and Vladivostok, the two Pacific terminals of Russia's great Trans-Asian Railway, at a period when the Boxer movement was beginning to crystallize, I was firmly impressed with the seeming impossibility of any successful uprising of the natives against the Russian power in Manchuria.

Along the line of the Chinese Eastern Railway, built almost entirely of American material, from tamping picks to rails and cross ties, towns and villages were springing up, as it were, in a night, to be peopled the day following by the peasant immigrants the Government was sending from the far off Black Sea district to develop the agricultural possibilities of the new province, while the Manchu farmers, induced to sell by methods and at prices agreed upon between Russia and China, became either laborers on the railway or gathered in wandering bands to annoy the workers.

Despite difficulties which seemed insurmountable, before the actual outbreak occurred the railroad was completed from Port Arthur to beyond Moukden, while from Vladivostok rails were being laid to Ningouta, with the expectation that within a few weeks all gaps would be closed and through trains running between Vladivostok and Port Arthur.

American Locomotives in Use.

Arriving in Port Arthur when the first engine, a Baldwin locomotive, was about to turn wheels toward St. Petersburg on the only completed section of the Chinese Eastern Railway, it seemed a strange anomaly that the telegraph wires were bringing in frequent reports of Cossack squads along the line being ambushed and massacred by roving bands of Manchus. The railroad, however, it was expected, would soon be in condition to move the 80,000 soldiers quartered at Port Arthur, Vladivostok and Khabarovka on the Amour, back and forth across Manchuria, so the officials felt they could afford to treat the matter lightly. Not until actual hostilities began did any one realize how greatly had Russia's strength in the Far East been overestimated. The first warning came when the Manchu and Korean

coolies rebelled against the introduction of the fire devils, as they called the American steam rock drills. This, the first strike on a Russian railway, was soon suppressed, but shortly after came the avalanche. Twelve million people arose against the builders of the railway, the work of years was undone in a twinkling, and it seemed at one time as though Russia was to be driven out of Manchuria—that is, affairs seemed to assume that aspect to outsiders who did not then understand the dogged, determined staying qualities of the Russians.

Harbin on the Sungari, the Russian city in Central Manchuria, from which the road was being built eastward toward Vladivostok, westward to Lake Baikal and southward to Port Arthur, held out against the Boxers, the province was saved to Russia, but the Government was made to realize that even with the completion of the Chinese Eastern Railway control of the new territory would not be made absolutely secure.

This one line of railway is no longer to be relied upon to bind to Russia 400,000 square miles of territory, peopled by 12,000,000 turbulent mountaineers, who for centuries have given rulers to China. Manchuria is to be fairly gridironed with railways. This country, which of late years has become, chiefly through Russia's activity, America's greatest market on the continent of Asia, is about to have its capacity for consumption multiplied many times; but only an agreement entered into now for the maintenance of an "open door" can save this great prospective market from being eventually closed to our products.

Still using Port Arthur and Vladivostok as her railway and military bases in the Far East, with a fair prospect of adding in time another still more valuable, from a strategic and commercial standpoint, Fusan, at the extremity of Korea and midway between the other two, Russia will extend her Manchurian railways in every possible direction.

One of the most important of the railroads recently decided upon at St. Petersburg will be an air line between Port Arthur and Vladivostok. Leaving the main line of the Chinese Eastern Railway probably at Dashitsia, where another branch diverges to New Chwang and Peking, the Vladivostok direct railway will necessarily follow the valleys of the Yalu and Tumen rivers, which form the boundary line between Manchuria and Korea.

No raids on the part of the gentle, inoffensive Koreans are likely during the construction of this road, which, it now seems probable, will be built with private capital. The strategic value of this road to Russian interest in the Far East is inestimably great. Dominating Korea along its entire land boundary, it threatens Japanese influence in every part of the peninsula. The Boxer outbreak, it will be remembered, diverted for a time the discussion of probable war between Japan and Russia over the eventual possession of Korea.

France as Russia's Catspaw.

France, Russia's ally, has secured a railway concession for a line between Seoul, the capital of Korea, and Wiju on the Yalu River. From Wiju to the main line of the proposed Port Arthur-Vladivostok Railway is but a few miles, and it seems needless to state that the connection will be built as soon as the French line is well under way.

The thorn in Russia's side is the Japanese railway concession for a railway between Seoul and Fusan. Both Russia and Japan have settlements at this Korean port, and each is striving to secure exclusive concessions. With Fusan in possession of Japan, it will be practically impossible, in time of war, for Russian ships to go from Vladivostok to Port Arthur, while with Fusan as a Russian terminal of her great railway the Czar could pour a constant stream of soldiers into transports, which would cross over to Japan in less than four hours. Korea is indispensable to Japan as a dumping ground for her surplus population, the islands being even now unable to support the 44,000,000 Japanese who inhabit them. Korea, Russia believes, is indispensable to the security and integrity of her Far Eastern possessions. Certain it is that it would be greatly to the advantage of commercial America to have Russia, with her remorseless energy and prodigal expenditure, develop the wonderful

riches of Korea, if we could only rely on an open door for our products once Russia has completed her railways, which would, under ordinary conditions, make Fusan the greatest commercial port of the East and Korea the richest section of Northern Asia.

While Russia is reaching out one iron hand from the Leatung Peninsula toward Korea the other is stretched toward Peking. Just prior to the late riots in China, Engineer Girshman went from Port Arthur to the capital city to induce the Empress to invite Russia to extend the Chinese Eastern Railway from Moukden to the city of Peking. The Empress refused to issue the invitation, but finally assented to the construction of the proposed railway. As a part of the line would parallel the English railway, then under course of construction, there was a vigorous protest. With her customary indifference to the plans of others conflicting with her own Russia ignored all protests, and at once cabled to America for quick delivery of rails and building materials, and the road was begun. Difficulties with England were encountered when New Chwang was reached, a truce being patched up, however, during the hostilities, which soon after broke out; but now that the battles with the Chinese are over Russia naturally dislikes to give up the English railway to Peking, which has recently been in her charge, and which her soldiers and workmen repaired. At Tientsin Russia seems determined to make a stand, as this is as much a railway terminal of her lines as it is of the English.

New Asian Railways.

However, Russia can afford to make concessions, for it is now probable that the proposed line will be built from Mysokla, a station of the Trans-Siberian Railway on the banks of Lake Baikal, through Mongolia via Ourga and Kalgan to the back door of Peking, while it is stated that superficial surveys have been made from the terminal of the Trans-Caspian Railway, across Asia to Peking, and that some day this road also will be constructed. From Peking southward the Belgian or Franco-Russia syndicate was building a railway to Hankow on the Yangtse Kiang, when the work was stopped by the Boxer outbreak. Once Russian rails reach Peking her trains will have right of way from St. Petersburg to the banks of the Yangtse Kiang, and her sphere of influence will not only touch, but invade, that of Great Britain.

Every portion of Chinese territory so far actually penetrated by Russian railways has rapidly come under practical control of the Czar. It is the building of the newly projected roads with American material and the future possibilities of American commerce in Russian Asia that chiefly interests us in the Far Eastern question.

Manchuria, now opened to the world by the Chinese Eastern Railway, lies in the same latitude as the Northern States of America. Everywhere within its borders wheat and other grain can be grown. The land is fertile, even the mountain sides affording excellent pasturage for millions of sheep and cattle. Coal, gold and iron mines exist, and other metals are being frequently found in paying quantities. The area of the country whose commerce is tributary to that part of the Chinese Eastern Railway actually under construction amounts to about 400,000 square miles, and has a population of 12,000,000.

To finance the building of her Far Eastern railroads Russia called upon her most detested friends of the ages—the Jews. With their aid the Russo-Chinese Bank was organized, and through this corporation were strained all the concessions squeezed from the unscrupulous scoundrels at Peking, who ruled and ruined the destinies of disappearing China. In the few years of its existence the Russo-Chinese Bank has established branch houses in every city from St. Petersburg to Yokohama, and now has agencies all over the world. Through this remarkable institution Americans transact their business with the Russian Government in the Far East, and receive their cash payment upon delivery of goods. Its resources seem unlimited, and its influence at Peking has been from its inception until the recent break up second

only to that exercised by the accredited diplomatists of the Russian Government.

At first all supplies and materials destined for the Chinese Eastern Railway found their way to Khabarovsk via the Amour River, but with the advent of American competition Vladivostok became the great receiving port from whence everything was shipped inland. So anxious was the Russian Government to develop this new country that a decree was issued whereby all imports were allowed to enter duty free. One or two American firms secured agents who could speak Russian and sent them across the Pacific to interview the railway officials. A trial shipment of Oregon lumber opened up a vast market for our Western timber, and orders were at once given for millions of cross ties for the railway, and several ships chartered to constantly supply them, but Russian engineers were still skeptical about the ability of Americans to manufacture durable tools; one of the engineers, however, wearied with the slow going, leisurely methods of the European firms, which had hitherto been supplying the railroad with its building material, gave a trial order. The American agent did not trust his order to the slow mail steamers, it was sent by cable, and to the astonishment of the railway officials the goods arrived in less than 60 days from the time the order was given; not only that, but the American made tools proved to be of a better quality, more durable and far cheaper than any supplied by the European manufacturers.

The Machinery Russia Needs.

It may interest the reader to know just what kinds of machinery Russia is ordering from America for use in the development of her Far Eastern possessions. The following is a partial list of machinery delivered by an American firm during my stay at Port Arthur: One flour mill, a number of inspection cars, boilers, vertical engine, sanitary supplies, plate straightening machine, spikes, crowbars, tamping picks, compressed air drills, hoisting crane, compound steam engine, power transmission machinery, ice making machine, crushing machinery, steam heating apparatus, steam drills, beams and fittings, electric plant, safes, mill machinery, liquor still and various kinds of heavy machinery.

As American firms continue to locate in Russian Pacific Coast cities, and our manufacturers are beginning to be represented more and more in Siberia and Manchuria by resident traveling agents, it may also be well to say something of the Government officials and engineers who give the orders for material for the Far Eastern railways.

At Harbin, in Central Manchuria, Chief Engineer Iugowitch and Superintendent of Construction Ignatius have their headquarters. These are the officials from whom the first orders for American material on the Chinese Eastern Railway had to be secured, and so jealous was Russia for her reputation as the sole builder of the great Trans-Asian Railway that President Kerbits in St. Petersburg was consulted before even an order for steel bridges, which Russia could never hope to construct and get to Manchuria, was finally given to an American agent. Fortunately, in Prince Hilkoﬀ, the director of the Russian railways, we have a friend who is partial to us, having himself once been in the employ of an American railroad. At present, unless the order be a very large one, the chief engineers of the various divisions are empowered to make purchases for equipment of the railway and local machine shops. Although at Harbin is located the main office of the Chinese Eastern Railway, Vladivostok is still a place of considerable importance.

Engineer S. Wachowsky, the railway purchasing agent and master of transportation, is located here, to forward American and other building supplies over that portion of the road which is completed; he has in charge all the Government steamers plying on the Amour and Sungari rivers, there being no other, so that he is a very important personage to our Russian speaking merchants who visit Siberia. Those who do not speak Russian need not call on business, for, while it is compulsory for pupils of the public schools of Vladivostok to learn our language, none of the railway engineers speak it.

About 60 versts north of Vladivostok, on the Usury Railway, is the former village of Nikolskoe, made a full fledged city in 1899. It is the present terminus of the direct line of the Chinese Eastern Railway, although the great docks and Trans-Siberian Railway Yards in Vladivostok, where the present Emperor drove the first spike of the now almost completed Trans-Asian Railroad, are to be turned over to the Chinese Eastern Railway Company. When this direct line from Nikolskoe to Kidolova, near the source of the Amour, is finished, the great work of the engineers will be completed and through trains will run across Europe and Asia from the Atlantic to the Pacific.

American Inventions at Work.

It is the difficulties encountered on this section that are delaying the completion of the road, which are now happily being rapidly overcome by an American invention, the steam rock drill, which blasts a way for the road through mountains of rock. The remorseless energy of their introducer, Engineer Nikolas Swiagin, who has charge of the Nikolskoe section, reminds me of a remark once made by Dr. Parkhurst, to the effect that the more difficult he found a mountain climb the more he enjoyed the effort. Engineer Swiagin is a typical Russian engineer, brainy, brilliant and daring; in fact, he was rewarded with the supervision over the construction of the most difficult section of the road because of his daring in surveying its route secretly years before the project was even contemplated by the Government, and at a time when it was almost as much as a white man's life was worth to enter the mountainous regions of Manchuria.

Many American manufacturers have met Purchasing Agent Kajechnikoff, who has visited America several times to select material for the Manchurian railways, and now that new lines are to be constructed doubtless other Russian engineers will visit us, and it is quite likely now that the Russian Government will select engineers for work in the Far East who understand the most useful language to Russia at present—English. In fact, a school for teaching this language has been established in Vladivostok, and we can do no better than to prepare a few bright young Americans for business careers in Russian Asia by having them taught the language of the Czar.

Harvey Patent Royalties.

WASHINGTON, D. C., October 29, 1901.—The Carnegie Steel Company has filed in the Court of Claims a suit against the United States to recover all the royalties paid by that company for the use of the so-called Harvey patents covering the face hardening process applied to armor plates under the company's contract with the Government executed in June, 1898. This suit is the sequel to the action of the Government in refusing to recognize the validity of the patents covering the face hardening process which has been employed by the armor plate contractors. The case is an unusually interesting one for the reason that the chief question at issue has a broad bearing upon the subject of patent infringement, being whether the Carnegie Company was actually "required to pay" royalties upon the demand of the patentees, and also whether this requirement was binding upon the contractor, and hence involved the liability of the Government to make reimbursement, even though the patent might be subsequently proved to be void.

The facts in the case are briefly set forth in the claimant's petition, as follows:

On June 3, 1898, the Carnegie Steel Company, Limited, and the United States entered into a contract, whereby the company agreed to manufacture for and deliver to the United States certain face hardened nickel steel armor plates, in consideration of which the United States, among other things, agreed that if the company was required to pay royalty for the use of the face hardening process as applied to the armor plates, the United States would reimburse the company for the amounts paid as such royalty, provided that the same should not exceed one-half of 1 cent for each pound

of face hardened armor delivered to the United States under the contract.

On or about April 1, 1899, the claimant was required to, and did, pay royalty at the rate of one-half of 1 cent a pound for the use of the face hardening process applied to certain of the armor plates delivered by it as aforesaid, to wit, armor plates of the aggregate weight of 1,604,890 pounds, and the royalty so paid amounted to the sum of \$8024.45.

The claimant has demanded that the United States reimburse it for that amount so paid as royalty, as the United States, by its contract, agreed to do, but the United States has failed, and refused, to so reimburse the claimant; the sum has not been paid, nor any part thereof.

An interesting feature of this case is the fact that after the Government refused to reimburse the Carnegie Company for the amounts paid out in royalties for the use of the face hardening process, the contractor thereafter declined to make any further payments to the patentees, who have thus far been unable to recover from the Carnegie Company. The Government is, therefore, disposed to insist that if the Carnegie Company has not yet been obliged to pay any other royalties under these patents, it was not "required to pay" those which it did pay and which it now brings suit to recover. The claimant, however, sets up the contention that as a responsible manufacturer it was the sole judge of its own liability for infringement, and that the payment made constitutes the best evidence of its good faith in the premises.

W. L. C.

The Duty on Magnesite.

The general appraisers at New York have rendered the following decision in the protest of W. N. Reardon and the Harbison & Walker Company against the decision of the Collector of Customs at New York, N. Y., as to the rate and amount of duties chargeable on certain merchandise, imported per "Pontiac" and "Styria," and entered February 7 and February 11, 1901:

The merchandise in question consists of magnesite. It was returned by the local appraiser as "ground magnesite, not purified; as magnesite cement," and duty was assessed thereon at the rate of 20 per cent. ad valorem under the provisions of paragraph 89 of the act of July 24, 1897. The importers claim that said merchandise is entitled to free entry under the provisions of paragraph 605 of said act, which reads as follows: "Magnesite, crude or calcined, not purified."

The only question of fact in dispute here is as to whether the magnesite was subjected to grinding before importation. This question is not important to the issue here, however, for paragraph 605 permits free entry of unpurified magnesite either in a crude or in a calcined state. The merchandise here is admitted to be unpurified and calcined, and clearly falls within the language of the paragraph claimed.

This case differs from G. A. 3370, wherein the Board held that similar merchandise did not fall within the provision for magnesite under the language of the tariff act of 1894. That act provided for the free entry of "magnesite or native mineral carbonate of magnesia," and the Board held that the processes of manufacture to which the article had been subjected had altered it into a cement, and that it was no longer the article enumerated in the act. In this case, however, we have the precise article specified—to wit, magnesite calcined and not purified, and the claim of the importer is, therefore, well founded.

The protests are sustained and the decisions of the collector reversed.

Tennessee Improvements.—Contracts are being let at Birmingham, Ala., by Don H. Bacon of the Tennessee Coal, Iron & Railroad Company for improvements at the Ensley steel plant, the consulting engineer being Julian Kennedy of Pittsburgh. There are to be added to the works four 50-ton open hearth steel furnaces and a hoop, tie and bar mill with a capacity of about 300 tons per day. The company have not the slightest intention of putting in a plate mill, as reported.

The Iron Age

New York, Thursday, October 31, 1901.

DAVID WILLIAMS COMPANY,	-	-	-	-	-	PUBLISHERS.
CHARLES KIRCHHOFF,	-	-	-	-	-	EDITOR.
GEO. W. COPE,	-	-	-	-	-	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	-	-	-	-	-	HARDWARE EDITOR.
JOHN S. KING,	-	-	-	-	-	BUSINESS MANAGER.

Agitation for Financial Reform.

A conspicuous feature of the recent meeting of the American Bankers' Association was the pronounced and repeated declarations in favor of radical changes in the financial system of this country. These came from the Secretary of the Treasury and from leading bankers who addressed the association. This feature of the convention is particularly noticeable, because the bankers have not taken a leading part in agitations of this sort. Of course, they are not indifferent, but there has been a pretty strong feeling among them that the politicians and the voters in the nonfinancial parts of the country were certain to antagonize anything that the bankers asked for, and that they would do well to conceal their interest in any legislation that they desired.

The fact that Congress enacted the gold standard law of March 14, 1900, has perhaps emboldened the bankers to feel that they would not injure a cause by openly supporting it, and there were at this meeting very strong declarations in favor of branch banking, and a more elastic currency, which is necessarily a currency based upon banking assets instead of Government bonds, and which is adverse to what is known as the independent treasury, the practice of collecting the Government revenues and putting them away in the Government vaults till they shall be needed. This feature of our financial system, under which the Treasury is holding \$167,000,000 in excess of all its demand liabilities, and aside from about \$110,000,000 deposited with the national bank depositories, began with General Jackson's war on the United States Bank and the popular fear of banks engendered by the panic of 1837. That is a long time ago, and banking methods have changed a great deal in two generations. The country had so far overcome its apprehensions of the banks at the time of the Civil War that it became possible to deposit collections from internal revenue in the banks. Our Government is the only one which collects its revenue faster than it needs to pay out the money, and so withdraws a large fund from circulation. It may also be added that our Government is the only one except that of Russia which designedly collects considerably more revenue than is necessary, depending upon its surplus instead of temporary loans to meet unforeseen emergencies.

The bond deposit required from banks of issue was not designed to secure the redemption of notes. We had had bad banking before the Civil War, and we had also had good banking. Large progress had been made between 1837 and 1863 in the art of banking and the regulation of bank currency. The provision for the deposit of bonds was designed to make a market for bonds when the war compelled the Government to get every cent it could raise by taxation or by borrowing. The market proved disappointing, and State banks notes were then taxed out of existence in order to force a market for Government bonds.

The independent treasury, which continually menaces the country with a monetary stringency, can be traced back to a style of banking long outgrown, and to an ig-

norant dislike and distrust of financial institutions, which is being pretty fast overcome. That feature of the national bank system which makes the issue of bank notes relatively small and inelastic, only very slightly responsive to the demands of business as they increase and contract through the various seasons of the year, is due simply to the necessities of a Government engaged in a war of tremendous proportions.

The financial education of the public has made decided progress, as is evidenced by the elections of 1896 and 1900. That the education and courage of men in political life has advanced is shown by the gold standard act. We now have a convention of bankers, undeterred by the use which populists and demagogues may make of their opinions, strongly condemning these relics of ignorance and war, and demanding for the Treasury and for the banking system of the country a modern, enlightened and consistent system. We have even some tentative experiments in the direction of branch banking, though the addition of this feature to the national banking system involves new legislation. It is opposed by local banking interests in the West and South for the very reason that it would be of great benefit to the merchants and manufacturers of those parts of the country; it would facilitate the loaning of Eastern capital and reduce rates of interest.

The Practical Aspects of Wireless Telegraphy.

During the past few days the public has been much interested in reports of English experiments in the transmission and control of electrical currents for considerable distances without the aid of metallic conductors. Perhaps these experiments have received more attention than they are entitled to, as often happens in the case of novel scientific demonstrations made under conditions securing them enthusiastic newspaper attention. With the possibilities of the Marconi system we are all reasonably familiar. Enough has been accomplished with it to show that under conditions which render the stringing of wires impossible it can be made useful. The apparatus employed is of considerable delicacy, and the adjustments need to be very perfect. It has never given promise of profitable substitution for the system of electrical communication carried on by means of metallic conductors, and in its latest and highest development is at best a supplementary method of intelligent signaling where no wires exist, as between ships and shore.

The recent English experiments, by what is known as the "Armori" system—which we assume to be a name compounded from those of the two engineers who have developed it, Armstrong and Orling—have gone a step beyond Marconi, though how long that step may be or of what practical value cannot be told from the information now at hand. No poles or receiving points to gather the current from the air are needed, as in Marconi's system, but the electric vibrations are sent through the ground. In the tests made on the 17th inst. it appeared that not only telegrams by the Morse system, but audible telephone messages, may be thus sent with practically useful result for considerable distances. It was also demonstrated that a marine torpedo may be guided from shore by this method, and caused to perform such evolutions as may be decided upon at the moment; also, that a lamp may be lighted at a distance of 2 miles by an electric impulse, eventuating in a spark, propelled through the ground. This is interesting, but not exactly novel.

From a somewhat meager account of the apparatus

employed we gather that the transmitting instrument, connecting with an ordinary eight-volt battery, causes electrical action between pre-arranged terminals, consisting of a high potential discharge and low tension current. By this means a succession of impulses are set in motion, which extend over a greater or less area, within which is set up a receiving instrument capable of converting the transmitted impulses into mechanical action. As a means of producing the characters of the Morse alphabet—the dots and dashes of ordinary telegraphy—this is not very surprising, nor in a high degree useful for general purposes of intercommunication. The continuous metallic conductor has the important advantage of offering a path of less resistance than either air or the earth, and so long as this remains true the wire system of telegraphy will have tangible practical advantages over any wireless system, for the same reason that for the movement of heavy traffic for long distances the railway has practical advantages over the highway and the traction road engine.

In some other aspects wireless systems of electrical transmission present features of exceeding interest, and suggest great possibilities. It has long been known that the earth is a great reservoir of electrical energy. When Cooke and Whitestone made their first telegraph they completed the circuit with two wires. This seemed a necessity; but it was soon discovered that the return wire was superfluous, since the earth was a sufficient return conductor. Whether the current, which returns to the point at which it is started, so to speak, is identically the same current sent out or an equal amount of electrical energy, which compensates by overflow at one point for what is added at another point, is, we believe, an open question. This is stated in essentially untechnical language, but perhaps for that reason it will be the more intelligible. To put the matter even more clearly; is the return current of an electrical circuit like water poured into one end of a vertical pipe and discharged from the other, or like the overflow from the sewer side of a full trap when a small quantity of water enters it from the house side? Inventors along the lines of Messrs. Armstrong and Orling proceed on the assumption that the earth is a full reservoir of electricity, like a pond brim full of water. If a stone is dropped into the reservoir waves are propagated in ever widening circles until they reach the edge. In the same way, if waves are started in the electricity of the earth, they are propagated in the same way, and their energy may be utilized to produce motion wherever the means of picking them up are provided. For the purposes of this hypothesis the earth must be considered as a unit. Water seems to have the same capacity as dry ground for transmitting electrical waves, or at least so nearly the same that a floating receiver can be reached as well as one on land. This fact has led the inventors of the *Armorl* system to claim that they can establish communication between ships at distances of 10 to 15 miles, if each has the simple plant required. In naval maneuvers this would have immense advantages over flag signals.

In wireless telephony the experiments were not entirely successful. This was attributed to the state of the weather, which was rainy, and to the impromptu character of the installation. Voices could be heard but not plainly distinguished. Indoors an illustration was given of a loud speaking telephone, which it is said can be affixed to any ship for a few pounds, and communication established between vessels or with shore. In this way collisions in fog, or stranding, should be much more easy of avoidance than at present. That this is

still a promising possibility is probably the best that can be said of it. As to the wireless direction of torpedoes in a practical way the naval authorities are skeptical.

Meanwhile we are likely to have the usual conflict of claims as to priority of invention. A dispatch from Carlisle, Pa., says that Daniel Drawbaugh, the venerable farmer who for years contested with Alexander M. Bell for the telephone patents, has long been working in this direction and has successfully used the earth currents for the transmission of messages for a distance of $\frac{1}{2}$ mile. That he expects to "revolutionize the business" goes without saying. We also note a report from Washington to the effect that the Signal Service has about perfected a system of wireless telegraphy, which the Government proposes to put into practical operation first on the Pacific Coast. The officers in charge of the experiments are quoted as expressing the conviction that they can receive and transmit messages at distances of 30 miles. If this is true there would seem to be no good reason why in time submarine cables should not be dispensed with altogether. The details are being carefully guarded, but enough has leaked out to warrant the conclusion that the new system is based on the principle of the Hertzian wave. From all of this it would appear that, as Mr. Laird Cowes sententiously remarked a few days ago, wireless telegraphy "occupies ground over which progress must be made."

The Export Gold Movement.

Exports of gold from New York are imminent. This is an anomalous condition; at this time of the year usually gold is being imported into the United States from Europe, hence the present tendency is full of interest and calls for special comment.

The present situation is the net result of a number of forces, both national and international, which have been operating on financial affairs since last spring, but the trend of the combined influence could not be clearly determined. Indeed, even now the foreign exchange market is a puzzle to practiced financiers, probably because of too close a range of vision. A few days' time, however, will give the necessary attitude for a more comprehensive view.

Taken all in all the present monetary position demonstrates the wonderful growth and strength of New York as a financial center, reflecting the unprecedented prosperity which has attended, and still attends, business enterprises.

Ten years ago the development of such features as now prevail would have been the signal for a flurry in the money market, but to-day there is scarcely a ripple. That the position now is somewhat artificial, as it was last spring, there can be little doubt, but that the powers that be have matters well in hand is evident. There is a conservatism in both financial and commercial circles which is strange at such a period of activity, indicating that speculative interests, as well as investment circles, have taken time by the forelock and have shortened sail. But this is an element of strength rather than of weakness.

The supply of commercial bills drawn against exports of cotton and wheat is generally so heavy by the latter part of October that gold is required of Europe to liquidate her indebtedness. This year, however, there is such a heavy demand for both commercial and bankers' bills to cover counter payments to Europe, especially to France, that the supply is about exhausted, and unless some expedient is resorted to, some unusual maneuver

made, gold will be exported from New York to Paris via London soon.

The unusually active demand for sterling exchange is to cover American subscriptions to the British war loan and also the return of French capital which was borrowed last spring to assist in floating numerous securities, chiefly industrial.

The supply of commercial bills drawn against cotton shipments to Europe has been about \$8,000,000 less than last year from the opening of the new season on September 1 to the present time. The exports of corn since July 1 have been less than one-third of what they were at the corresponding time last year, but the foreign shipments of wheat have been almost twice as large as in 1900. Altogether the excess of wheat exports more than compensated for the decrease in corn exports, as far as commercial bills of exchange are concerned at least. Very few commercial bills of any kind, however, have come upon the market, as the urgent demand has actually absorbed them before they were drawn—that is, the bills were contracted for in advance of shipment; indeed, cotton "futures" have been quite an important feature.

Bankers' bills, too, although adequate to meet the demand thus far, are in light supply. This results from the large investments made by American bankers in Europe. The trade balance is largely in favor of the United States, notwithstanding the heavy remittances to Europe, but American credits being largely tied up in time loans are not available to meet the present emergency.

Paris is the magnet that is now drawing gold from the rest of the world. Having loaned heavily to other countries, especially to Germany, in September, losing about \$57,000,000, she is now strengthening her position by recalling the money, having drawn about \$7,000,000 from London during the current month, and now seems likely to further recoup herself at the expense of New York. It is reported that the French Government is about to place a loan of \$50,000,000. In addition railway and other loans of some magnitude are pending at Paris, while labor troubles are anticipated about November 1. The copper situation, too, seems to trouble the French, and it is small wonder that Paris is sensitive on this point when her Secretan experience of a decade since is recalled. But it is not London and New York alone that are feeling the effect of French contraction; Berlin balances are being drawn upon, too. The whole movement seems to indicate a loss of confidence in the international situation by the French, and a determination to be in a strong financial condition for any emergency.

But while New York seems likely to lose moderate amounts of gold to Paris, there continue to be imports from Australia via San Francisco, and small amounts from Mexico and South America; the Klondike is another source of supply.

Domestic movements of money have also had a bearing upon the situation, as the shipments of currency to the interior and the transfer of \$10,000,000 to Philadelphia in payment of coal property. The bank statement system of "averages," however, does not make clear the actual local monetary situation. It is noteworthy that the payments of internal revenue were larger last week than at any time since the week ended September 13.

To sum up: An acquaintance with the monetary currents of the six months just passed is to have revealed the wonderful resources of the American money market, the wealth and financial strength of the nation and the growing international importance of New York as a money center.

The Cost of Steel in South Wales.

In the course of an editorial discussion the *Iron and Coal Trades Review* says: We have before us as we write the complete cost sheets of one of the largest works in South Wales, which is fairly typical of the best situated works producing Bessemer pig iron and Bessemer steel in Great Britain. The figures show that the normal cost of iron was about 42 shillings per ton, of which the principal details are appended:

	s.	d.
Labor	3	5.09
Coke	10	6.82
Iron ores	22	6.79
Limestone	1	3.09
Stores	9	5.18
Traffic	1	4.83
Incidentals	0	7.20

Here we find that the ore costs nearly 22 shillings 7 pence, the coke about 10 shillings 7 pence and the labor over 3 shillings 5 pence per ton. The coke is manufactured by the same company and is stated in the cost sheets to cost from 8 to 9 shillings per ton at the ovens. This is about double the normal cost of Connellsville coke, which is at the disposal of the chief American pig makers.

It is not long since a works in South Wales with which we are well acquainted was producing Bessemer steel ingots for about £3 15s. per ton, and might have produced them for even less with an up to date plant and the most complete labor saving methods and appliances. Here are a few of the chief items of this cost:

	s.	d.
Labor	2	9.83
Coal	1	2.40
Pig iron	42	7.64
Spiegeleisen	3	5.33
Crop ends, &c.	1	6.81
Stores	0	10.42

The cost of producing steel blooms at the same works was as under:

	s.	d.
Labor	1	6.49
Coal	1	8.40
Royalty	0	2.02
Ingots	58	5.19
General charges	1	8.42

These costs might have been much reduced, but as a rule the tonnage produced is relatively small, and the conditions have not admitted of the most regular working.

Changes in the American Tin Plate Company.

D. G. Reid has resigned as president of the American Tin Plate Company, and Warner Arms as second vice-president. Mr. Reid gives up the active conduct of the affairs of the company in order to devote his entire time to the duties of his position as a member of the Executive Committee of the United States Steel Corporation, and Mr. Arms to gratify a long expressed desire to rest from the exacting duties of active business after more than 30 years' continuous service. The vacancies occasioned by these changes have been filled by the election of the following named gentlemen: W. T. Graham, president; W. M. Leeds, first vice-president; Frank Dickerson, second vice-president. In connection with the office of second vice-president, Frank Dickerson will still retain his position as general sales agent of the company.

Charles D. Hawk of Washington, D. C., has made application to the Board of City Commissioners of Youngstown, Ohio, for a franchise to erect a gas fuel plant in that city and pipe the streets for the purpose of supplying private customers with fuel gas. It is proposed to erect a very large plant in Youngstown to make fuel gas.

W. J. Rainey, Cleveland, Ohio, is in the market for 400 railway freight cars for carrying coke. On account of scarcity of cars, he is compelled to increase his equipment.

Lake Mining Matters.

The Copper Country.

DULUTH, MINN., October 26, 1901.—The last of the 7000 tons of Bigelow-Lewisohn copper at Dollar Bay has been moved East, to consumers, the ship "Mohawk" taking a cargo valued at \$1,015,000 a few days ago. Most of the mines are now sold ahead, and are shipping as fast as the metal is made.

An innovation for the copper country is to be installed at the Quincy mine, almost a mile under ground, where tramping to No. 6 shaft on the forty-sixth and forty-seventh levels will hereafter be by electricity. The equipment is furnished by the General Electric Company, and for the present consists of two locomotives and the cars, &c., required therefor. The electric roads will be about 2000 feet long each. Electric tramming has been in vogue at the Pioneer (iron) for two years, and was installed this fall in the Hibbing mines of the Lake Superior Consolidated Iron Mines.

At the Calumet & Hecla mills there is an enormous tonnage of tailings, carrying perhaps an average of 15 pounds of copper to the ton, that lies waste. Experiments will be undertaken in the possibility of reworking and saving these tailings, and as the percentage of copper contained therein is greater than in the rock mined by the Atlantic, which runs about 12½ pounds to the ton, there ought to be a considerable saving. It was not long ago when the Calumet tailings represented a larger waste than to-day, and there, as everywhere in the copper country, the percentage of loss is constantly diminishing. The Calumet & Hecla is experimenting with metallurgists steadily employed in the work. The five amygdaloid shafts temporarily abandoned by the company a year ago may be reopened shortly, in which case about 1500 men will be added to the payroll. The company mills are treating a grade of rock now that would have been wasted a few years ago, on account of the present price of copper, and as a result the percentage of mineral in the rock will show a decrease this year.

The new stamp mill for the Wolverine mine is inclosed and the machinery is being set up. The Mohawk mill, adjoining, is ready for the superstructure. The two mills are on the shore of Lake Superior at the mouth of Tobacco River, and have easy access to the mines by the Mohawk Railway and plenty of room for stamp sand for time indefinite. Each will have two stamps.

Water has been turned into the new steel gravity dam of the Atlantic and Baltic mills, and the great job is completed.

Two years ago the Arcadian Copper Company were spending \$1,000,000 to prove a mine and equip it on the surface and underground in the St. Mary's lands just northeast of Hancock. This week the managers of the company have announced the closing of these St. Mary's shafts, probably permanently, and the confining of work to be done to the old mine or Douglas shafts. No copper mine ever spent such money for rapid development as did Arcadian. In the boom period of 1899 its stock went to better than \$90 a share, now it is selling for \$6. It was a "Standard Oil" flotation, so-called, and the probability is that most of its stock is still owned by the original holders, as lake copper investors never believed in it and never invested.

The new Ontonagon County mines, Mass, Adventure and Michigan, are finding much native copper in mass in their workings. Last week at the Michigan a 6-ton mass was taken to the surface, and this week at the Mass 8 tons that had been found as a single chunk was brought up.

Iron Ranges.

October shipments will not show up as well as was hoped on account of the delays by bad weather and by the well-known shortage of cars at lower lake ports. At present vessels are taking grain rather than ore, as the delays at ore docks are serious. The conviction is forcing itself more and more strongly upon transportation interests that more dock and rolling stock capacity

on the lower lakes is an absolute necessity before another spring. The freight rate on ore is now firm at \$1 the ton, which is being paid for shipments up to November 15.

Of late Marquette range mines have been doing better than earlier in the season, and some of the stocks that it was expected would be carried over the winter may be in part moved this fall. Gogebic shipments from Ashland to date have been more than 2,550,000 tons, which is more than for any full season except those of 1892, 1899 and 1900. With the small Gogebic shipments from Escanaba and what will yet go down from Ashland the range will ship between 50,000 and 100,000 tons more than any previous year, passing 3,000,000 tons by considerable. This certainly does not look like the decadence of the Gogebic, so freely prophesied by some ill informed writers. Mesaba shipments are heavy, though there is considerable falling off from the height of the season. Some small mines on most ranges are through and have closed, but their entire output is not such as to make much difference.

The Algoma Commercial Company, F. H. Clegue, manager, are to open a second mine in the Michipicoton range in Ontario the coming winter. It lies some 10 miles further inland than the Helen, from which about 400,000 tons have been shipped this year so far. A railroad has been completed to the new location. During the winter a tunnel 1800 feet long and 4.5 x 6.5 feet in section will be driven to Park Lake, that floods a portion of the mining property. The tunnel will expose a surface of 62 feet now submerged. The new mine will ship some ore next year, and of a Bessemer quality, it is stated. By next July the Algoma Central & Hudson Bay road, building from the Clegue works northerly, will connect with these two mines, giving them direct rail connection to the company's mills and furnaces. The Bessemer plant and rail mill at the Sault, that were to have been done this fall, cannot now be ready until early in 1902, and that will be quick work; and it is now expected that the first two charcoal furnaces will come into blast late next year.

Chiefs of the several exploring and prospecting operations that have been carried on very extensively during the year in the great region north of Lake Superior and around—mostly to the east of—Lake Nipigon, have returned to civilization. Their work is completed for the present. Though reticence is characteristic of these men, it is learned that results are disappointing, and that there is so far little encouragement for further exploration for iron ores in that region. This is important, as the Canadian Mining Bureau had recommended the region as a field for possible finds, and it was hoped from the surface indications that ore of value might be located therein. While the region is of vast extent and favorable in some geological characteristics, and while ore may yet be found in abundance by accident, as was the Helen mine in Michipicoton division, the chances are not considered the best.

No. 7 shaft house at the Ashland mine, Gogebic range, was burned Friday. The shaft was an important producer, and the loss to production will be material.

On the Marquette range Section 21 mine of the Oliver Company has resumed hoisting and the output will be considerably increased with lessened costs. The Champion Iron Company will explore the old North Hampton mine. Their new exploration near the present mine looks well. The shaft is 50 feet deep and ore is coming out. Chester mine is closed for the year after an output of 23,000 tons. Negaunee will carry 18,000 to 20,000 tons over the winter. Some exploring is to be done near Swanzy at once.

D. E. W.

Among the orders which have been received by Cincinnati concerns recently which are a little out of the way of the common was one for two oxidized copper doors for the Birmingham Trust & Savings Company, Birmingham, Ala. While the doors are not remarkable for their size, weighing only about 400 pounds apiece, yet they are remarkable for their artistic design and finish. This order was taken by the M. & M. Machine Company.

OBITUARY.

LEDLIE W. YOUNG.

After a brief illness Ledlie W. Young died in Pittsburgh, at the age of 30. At the early age of 16 Mr. Young began his business career with Jones & Laughlins, later becoming connected with the office force of the Union Line. Mr. Young afterward accepted a responsible position with the Carnegie Steel Company, relinquishing this to connect himself with Joshua W. Rhodes & Co. In this position his capable business ability and energy brought him into such prominence that he was soon recognized as one of the most promising of Pittsburgh's younger business men. Absolute integrity and close attention to detail made his advancement rapid to the highest positions of trust and confidence, and at the time of his death deceased was connected with several important enterprises and industries, in whose success and development he was largely instrumental. Mr. Young at the time of his death was a



LEDLIE W. YOUNG.

member of the firm of Joshua W. Rhodes & Co., iron factors; the Fort Pitt Iron & Steel Company, and was treasurer of the Cherry Valley Iron Company.

EDWARD C. LEWIS.

The death occurred on October 24, in his seventysixth year, of Edward C. Lewis, president of the Waterbury Farrell Foundry & Machine Company of Waterbury, Conn. Mr. Lewis was born at Welsh Pool, North Wales, and came to this country with his parents in 1831, locating in Bridgeport, Conn. In 1849 he went to Ansonia as foreman for the Farrel Foundry & Machine Company, subsequently removing to the company's Waterbury plant in a similar capacity. By his executive ability and thorough knowledge of the business Mr. Lewis rose until he became the principal owner and president of the concern. He was closely identified with the industrial growth of Waterbury, and was interested in no less than 27 different business and manufacturing enterprises in that and other Connecticut towns. Mr. Lewis was president for a number of years of the Capewell Horse Nail Company, retiring a year ago, and was also president of the Oakville Company of Waterbury up to the time of his death. He was a director of the Hendey Machine Company of Torrington, the Plume & Attwood Mfg. Company, Holmes, Booth & Haydens, the Benedict & Burnham Mfg. Company and the Bridgeport Forge Company of Bridgeport. He held several offices under the city government of Waterbury, and had served in the State Legislature. Mr. Lewis was one of the founders of the Waterbury Hospital, and a generous supporter of all worthy objects. He was regarded as one of the most public spirited and useful

citizens of his town, and enjoyed the respect and esteem of a wide circle of business and social friends.

NOTES.

ALFRED RAYMOND, son of Dr. Rossiter W. Raymond, died on October 28, at the home of his parents in Brooklyn, N. Y., from typhoid fever, aged 36 years. He was born in Lakewood, Conn., and educated at the Polytechnic Institute in Brooklyn and Yale College, from which he graduated in 1888. He then took a course in the School of Mines of Columbia College, after which he spent some time studying in Europe. Mr. Raymond was subsequently appointed to assist his father in the work of editing the publications of the Institute of Mining Engineers. He possessed much talent in a number of directions, having decided gifts in art, music and poetry, as well as in architecture and engineering.

CHARLES F. SMALLEY, a well-known manufacturer of agricultural machinery at Manitowoc, Wis., died on October 21, aged 44 years.

HENRY O. BRADLEY, the last surviving member of the firm of Osgood Bradley & Sons, car builders, of Worcester, Mass., died October 22 of pneumonia, after a short sickness. He was the youngest son of Osgood Bradley, who built the first car in the United States and founded the car manufactory which bore his name. He was 73 years old.

JOSEPH E. FALES, a retired member of the firm of Rice, Barton & Fales, manufacturers of paper and textile machinery, steam boilers, &c., of Worcester, Mass., died on October 21, at the age of 91 years. He was a native of New London, N. H., and had been in business in Worcester since 1845. He retired from active work some years ago.

J. E. PATTERSON, assistant superintendent of the 28 and 38 inch mills of the Homestead Steel Works of the Carnegie Steel Company, at Homestead, Pa., was instantly killed on Saturday, October 26, at the works. Mr. Patterson was 32 years old, and had been connected with the Carnegie Steel Company for 12 years.

D. P. PATTIN of the firm of Pattin Brothers & Co., machinists, of Marietta, Ohio, was burned to death on October 20 in a fire that destroyed the shops of the firm.

HENRY LLOYD, well known in iron circles of the Pittsburgh district, died on October 19 at his home in Pittsburgh, aged 47 years. He was born at Hollidaysburg, Pa., and had been a resident of Pittsburgh from his childhood. He was president of the firm of H. Lloyd & Sons, iron dealers, and treasurer of the Linden Steel Company.

Breach Block Blown Off Brown Segmental Gun.

The Brown segmental wire tube 10-inch gun has been undergoing tests at the Sandy Hook proving grounds for some time past. On Monday the breach block and about 8 inches of the trunnion jacket were blown off. The block in its flight struck a battery of six 12-inch breech loading rifled mortars, which were dismounted and the foundation upon which they stood more or less injured. All those interested in the tests were in the bomb proofs and therefore escaped injury.

This was the ninth time this gun had been fired, each time with increased charges of nitro-cotton smokeless powder. The exploding charge consisted of 175 pounds of powder driving a full service projectile weighing 575 pounds, which, notwithstanding the accident, attained a muzzle velocity of 2364 feet a second, the pressure being 55,550 pounds to the square inch.

The following report, which was sent to Washington from the proving grounds, shows that the damage was confined wholly to the breach, the segmental portion of the gun tube being uninjured:

"In testing powder in the Brown segmental wire tube 10-inch gun to-day the second shot, discharged with 175 pounds of nitro-cotton powder and a 575 pound projectile, registered 55,550 pounds pressure to the square inch; the overhang of steel casting trunnion jacket blew off flush with the segmental wire tube, carrying breach action. The bursting was caused by insufficient gas

vent in the breech block. No other part of gun was injured. System not affected. No one hurt. Apply for permission to remove gun to realter breech action and continue firing."

It is expected that a new breech block can be fitted to the gun in about 60 days, when the tests will be renewed.

MANUFACTURING.

Iron and Steel.

E. Erikson, consulting engineer, Pittsburgh, has a large amount of work on hand. He is building for the Ashland Sheet Mill Company, Ashland, Ky., a continuous billet heating furnace with gas producers and having a capacity of 130 tons of 4 x 8 inch billets every 24 hours. Billets will be heated in this furnace for the three-high sheet bar mill which the Ashland Sheet Steel Company are erecting in connection with a four-mill sheet plant. Mr. Erikson is also building for the Tuscora Steel Company, at New Comerstown, Ohio, four-sheet and pair furnaces and four-annealing furnaces. The latter will be in two pairs, with a gas producer for each pair. The Tuscora Steel Company are erecting a four-mill sheet plant. Mr. Erikson has also about completed the building of two open hearth steel furnaces, one 50 tons and the other 25 tons, for the Coxey Steel Casting Company, at Mt. Vernon, Ohio. It is probable that a number of gas producers will be added to this plant, as Mr. Coxey has been notified that the city cannot furnish enough natural gas to operate his plant.

The report that the American Tin Plate Company would very much enlarge their Johnstown Works, at Johnstown, Pa., is untrue. Nothing has been decided upon in reference to the Johnstown plant.

The Lorain Steel Company, Johnstown, Pa., have let contracts and broken ground for an addition to their steel foundry. The contract for the building complete has been awarded to the Penn Bridge Company of Beaver Falls. Geo. P. Suppes, assistant purchasing agent of the Loraine Steel Company, is making arrangements for new equipment.

The Laughlin Nall Company of Wheeling, W. Va., who have had a six-sheet plant under erection at Martin's Ferry, Ohio, for some months, expect to start up two of the mills this month and two more in a short time. The fifth and sixth mills will not be ready for operation for several months. The Laughlin Nall Company will manufacture corrugated roofing and siding and stamped ceiling, and will also make black and galvanized sheets of the best grades.

The La Belle Iron Works of Steubenville, Ohio, have given the Welmer Machine Works Company of Lebanon, Pa., an order for a blowing machine having a 42-inch diameter Corliss steam cylinder, 84-inch diameter Welmer air cylinder with a stroke of 60 inches.

The Republic Iron & Steel Company have placed an order with the Welmer Machine Works Company of Lebanon, Pa., for a third engine for their Hannah Furnace. The engine will be the same as the two Welmer blowing engines lately installed at this furnace, which are 50-inch diameter steam cylinders, 96-inch diameter, air cylinder stroke 60 inches. They have also given the same company an order for an engine of the same size to be installed at their Hazleton Furnace in Youngstown, Ohio.

The New Process Mfg. Company of St. Louis, Mo., makers of plain and annealed wire and bale ties, operating a manufacturing plant in St. Louis, Mo., and a wire mill in East St. Louis, Ill., report that they have been compelled to run their plants night and day, in order to supply the large and increasing demand for their products.

The property of the Atlantic Tube Company, at Beaver Falls, Pa., was sold at public auction on Saturday, October 26, to Charles P. Orr, who is said to represent the bondholders. The plant has been idle for some time, but will probably be operated by the Pittsburgh Seamless Tube Company in the manufacture of seamless tubes.

The Sloss Sheffield Steel & Iron Company, Birmingham, Ala., have recently been enlarging and improving their four furnaces. No. 3 furnace at North Birmingham was blown out in the spring, thoroughly overhauled and remodeled and put in blast again about a month ago. At the same time No. 1 furnace at the city plant was being overhauled and went in blast on October 20. No. 4, at North Birmingham, is now undergoing the same improvements and will be put in blast about November 15. As soon as No. 1 at the city plant was blown in, No. 2 was taken out, and will be completely remodeled, with expectations of being ready for blowing in on February 15. The shipments of iron and coal by the company during October have been the largest ever made by them in any single month of their history, and would have been considerably more if all the cars they required for shipments could have been secured.

The report is officially denied that the Sligo Rolling Mills of Phillips, Nimick & Co., on the South Side, Pittsburgh, are to be sold to the Panhandle Railroad. An offer was made some

time ago for the ground containing the works, but it was refused. The Sligo Rolling Mill is one of the oldest iron plants in Pittsburgh, having been originally built in 1825, and operated by Lyon, Shorb & Co. In 1873 the works became the property of Phillips, Nimick & Co. The output is plates.

Furnace D of the Edgar Thomson group of the Carnegie Steel Company, at Bessemer, Pa., is out of blast and will be rebuilt and enlarged, the capacity being brought up to about 400 tons a day or more. Carrie, No. 1, which is one of the new furnaces under erection for some months by the Carnegie Steel Company, at Rankin Station, was blown in last week and a slight accident occurred by which four or five men were injured. The furnace was not badly damaged and can be repaired in a week or two. It is expected to make from 400 to 500 tons a day, and gives the Carnegie Steel Company a total of three Carrie furnaces now in blast at Rankin.

The puddling department of the Altoona Iron Company, at Altoona, Pa., manufacturers of refined bar iron, was closed down for three days recently on account of scarcity of coal, but the balance of the mill has been in operation right along. The report that the whole plant had closed indefinitely is incorrect.

The Rolling Mill Company of America, Connellsville, Pa., have been incorporated with a capital of \$100,000. It is understood that the company will erect a large sheet steel plant at South Connellsville. The officers are William J. Logan, president, and Harry L. Kurtz, secretary and treasurer.

General Machinery.

The Lee & Osborn Machinery Company, New Haven, Conn., will shortly be reorganized under the name of the Osborn Machinery Company, and the capital will be increased to \$25,000. The company have purchased the machinery and elevator business formerly conducted by Duncan MacArthur at New Haven, and have secured his personal services as superintendent of the mechanical department. In addition to their regular business as dealers in new and second hand machinery, the new company have a most complete machine shop and are prepared to build special machinery, do general repair work and jobbing, and to supply cranes, foundry equipments and air hoists. They will also contract to equip factories and other buildings with steam, mechanical and electrical plants, belt and rope transmission, and to install dumb waiters, hand, steam and electrical elevators of all styles and sizes.

Though the full details of the plans have not yet been worked out, the plant to be erected by the recently incorporated Colburn Machine Tool Company, at Franklin, Pa., will consist of a main machine shop, 100 x 200 feet, engine room, 30 x 45 feet; boiler room, 25 x 45 feet; blacksmith shop, 30 x 50 feet, and toilet rooms, 25 x 50 feet; all to be of modern construction with steel trusses for the roof supports, &c. The plant will have electric transmission throughout. L. H. Colburn is general manager.

The Brown & Zortman Machinery Company of Pittsburgh have received a large contract for machinery from the Sharon Steel Company, Sharon, Pa. This includes threading, tapping and cutting off machines, which will be installed in the new tube mill which the Sharon Steel Company will build. These machines will be built by Taylor-Wilson Company of Allegheny, and will keep their shops in full operation for four or five months. The Brown & Zortman Machinery Company are agents for the products of this concern.

The Loetzer Valve Mfg. Company of Towanda, Pa., are installing machinery for the manufacture of valves.

The Brown & Sharpe Mfg. Company of Providence, R. I., are building a new foundry. See "Foundries."

The Norton & Cole Machinery Company of Cincinnati, Ohio, who do an exclusive business in second-hand power equipments, have just finished the erection of a boiler shop addition to their plant. The new building is 50 x 200 feet, and they are equipping it with a number of modern tools to be used in repair work. They are also now engaged in the erection of a large warehouse which will give them a total ground space of 50 x 450 feet when it is finished. Among the recent shipments of this concern are an outfit to San Fernando, North Luzon, Philippine Islands, another to Tampico, Mexico, to a large sugar refinery which is being erected there. They have also recently sold an order for seven engines with winding apparatus to the Marmet Coal Company of that city.

J. M. Robinson & Co. of Cincinnati, Ohio, report trade as excellent, and say that among the recent export shipments was one for quite a number of their cornice machines to Honolulu. Galvanized iron cornice appears to be a new thing over in that island, and these are the first shipments made to that point.

Greaves-Klusman & Co. of Cincinnati, Ohio, report that trade has been so good with them that for the past six months they have had to run overtime. Recently they have taken some excellent orders and made large shipments of engine lathes to the Pacific Coast.

The William E. Gang Company of Cincinnati, Ohio, report that since the settlement of the strike business has been much more active than for some time prior to that event, and that they have now disposed of all their surplus stock which had accumulated during the dull period of last spring.

An order has been placed with the Lane & Bodley Company, Cincinnati, Ohio, for two large engines for the plant that is to be erected at Washington, Pa., by William Jessop & Sons, Limited, of Sheffield, England. The engines are to be of the Corliss type, one being of 28-inch bore and 72-inch stroke, and the other 24-inch bore by 60-inch stroke. The new plant is to be started soon after April 1, the engines and much of the machinery for the plant being deliverable at that time.

The Athens Foundry & Machine Works, Athens, Ga., were incorporated under the laws of the State of Georgia with a capital stock of \$15,000, with the privilege of increasing it to \$25,000. The President is John R. White, general manager J. A. Norton, and superintendent J. H. Houchin. They occupy the plant of the old Athens Foundry & Machine Works. The old machinery is being reconstructed and new machines have been installed with the view of enabling the company to manufacture power transmission machinery. They intend devoting particular attention to this line.

Some little machinery will probably be required by the H. & C. Corset Company, Bridgeport, Conn., who have plans prepared for a new brick factory and power plant, 50 x 150 feet.

The Southern Iron & Equipment Company of Atlanta, Ga., are building extensive shops for the purpose of overhauling locomotives, passenger and freight cars. This concern carry in stock a large assortment of locomotives for every variety of service.

The Williamsport Iron & Nail Company, Williamsport, Pa., are building an addition to their plant. It is possible that additional cut nail machines will be installed.

The El Paso Foundry & Machine Company, El Paso, Texas, have increased the capital stock from \$50,000 to \$100,000 and are installing machinery for the manufacture of bolts and nuts, a large demand for which is springing up in their territory. They employ about 125 men at present and hope to double the capacity during the coming year. Most of their business is done with mining and smelting companies in Arizona, New Mexico and Mexico.

A quantity of new machinery will soon be required by the Wals-King Tool Company, Cincinnati, Ohio, recently incorporated for the manufacture of boring mills and other kinds of metal working machinery, who have secured 3 acres of ground on Clifton avenue and the Baltimore & Ohio Railway, upon which they will erect a new plant. They expect to be able to occupy the new plant by March 1.

New equipment is required by the Southern Engine & Boiler Works, Jackson, Tenn. See "Boilers, Engines and Accessories."

Machine tools will be added to the plant of Mayer Bros., Mankato, Minn. See "Boilers, Engines and Accessories."

Boilers, Engines and Accessories.

The Southern Engine & Boiler Works, Jackson, Tenn., advise us that they will shortly be in the market for two 45-foot span electric traveling cranes, also several latest improved machine tools, cupola and blower for foundry. The improvements which the company propose making consist of a machine shop, 160 x 115 feet, two stories; engine room, 40 x 40 feet; boiler room, 40 x 24 feet; blacksmith shop, 31 x 50 feet; foundry, 70 x 120 feet; also pattern storage room, men's wash room, and remodeling of boiler shop. As noted in these columns last week, the contract for the foundations of the new building has been let, but the contract for the steel structure has not yet been placed. As soon as the new buildings are further advanced the orders for equipment will be placed.

The William Tod Company, Youngstown, Ohio, have received an order from the Colorado Fuel & Iron Company, Pueblo, Col., for a horizontal vertical compound engine. The engine is to be 32 and 56 x 48. It will be the duplicate of the engine furnished the Carnegie Steel Company for the Edgar Thomson Works, and will be used for driving the rail mill of the Colorado Fuel & Iron Company. The William Tod Company have also received an order from the American Sheet Steel Company for a 36 x 48 inch automatic geared engine, for installation at the Wellsville Works, Wellsville, Ohio.

The John H. McGowan Company of Cincinnati, Ohio, are running night and day to catch up with their orders. They are extremely busy building a number of electrically driven pumps for coal mining plants, which they find are displacing the pumps hitherto in use. They have just completed the setting up of a vertical compound pumping engine for Vevay, Ind.

The Mankato Mfg. Company, Mankato, Minn., are adding to their business the manufacture of boilers, smoke stacks and all kinds of sheet iron work, and have secured the services of Ed. Hill, lately connected with the Mankato Steam Boiler Works.

New Machine tools will be added to the plant of Mayer Bros., Mankato, Minn., founders, machinists and manufacturers of the Mayer gasoline engine, who are erecting a new boiler shop. The firm recently purchased the plant of the Mankato Steam Boiler Works, whose machinery and tools they have removed to their own works, where the boiler making business will be continued.

The Youngstown Iron Sheet & Tube Company, who are building large skelp mills at Youngstown, Ohio, have bought two engines from the William Tod Company of that city to drive these mills. The engines are 22 and 40 x 42 inches and 22 and 40 x 33 inches.

The Buckeye Engine Company, Salem, Ohio, manufacturers of Buckeye automatic cut-off engines, have lately shipped to the Labelle Iron Company, Steubenville, Ohio, two 18½ inch and 36 x 30 inch cross condensing compound engines, which are to drive by direct connection two 375-kw. alternating generators; also one 22-inch and 40-inch by 30-inch cross condensing compound engine, that is to drive by direct connection a 500-kw. direct current generator. The generators are built by the Westinghouse Electric & Mfg. Company of East Pittsburgh.

The Best Mfg. Company of Pittsburgh, manufacturers of valves, castings and piping, have just made shipment to Sydney, New South Wales, of some 260 tons of pipe, valves, fittings, &c., to be installed in the central generating station of the Sydney City & Suburban Tramway system, which is to be equipped with \$800,000 worth of American machinery, the principal items of equipment being three 1500-kw. generators, manufactured by the General Electric Company, and the same number of engines of 1500 nominal horse-power, each of Allis build.

Thomas Bailey & Co., Athens, Ga., have just finished two 50 horse-power engines for J. T. Pittard, Winterville, Ga., and one 125 horse-power engine and boiler for John Bolstick Morgan County, Ga. This year they will manufacture about 20 engines and boilers and build 12 saw mills. They will build 5000 cotton planters this year, which will include 3500 for the Beck & Gregg Hardware Company, Atlanta.

Fires.

W. B. Miller is now buying the machinery for his kindling wood factory at Salisbury, Md., which he will start at once to rebuild. It was destroyed by fire last week, entailing a loss of about \$25,000, with insurance of \$14,750.

The box making plant of Fred J. Derry, at Danvers, Mass., was destroyed by fire on the 20th inst. The loss is about \$20,000, with insurance of about half that amount.

The S. & O. Engraving Company's plant at Akron, Ohio, suffered a \$3000 loss by fire on the 20th inst.

The Reinbeck Flour Mill, Reinbeck, Iowa, was last week entirely destroyed by fire. The loss is about \$10,000, partially covered by insurance.

October 23 the plant of the G. H. Hammond Company, at Hammond, Ind., suffered a \$500,000 loss by fire. Among the buildings burned was the blacksmith shop.

The Chris. Mueller Lumber Company's sawmill at Davenport, Iowa, was last week destroyed by fire. Loss \$110,000; insurance, \$40,500.

The Samuel Cupples Woodenware Company's plant at St. Louis, Mo., was damaged by fire October 25 to the extent of \$65,000. Fully insured.

The large cyanide plant at Ragged Top, S. Dak., owned and operated by the Spear Fish Mining Company of Colorado Springs, Col., was burned October 26. The plant was valued at \$50,000, and was insured for half that amount.

Fire destroyed the W. M. Retter Lumber Company's mills at Dry Forks, W. Va., on the 26th inst. Loss, \$60,000; insurance, \$25,000.

The Lafean Mfg. Company, whose paper mill at York, Pa., was recently destroyed by fire, will replace it with a new mill, 250 x 45 feet, of brick and one story, the erection of which will be shortly begun.

Foundries.

The Scullin-Gallagher Iron & Steel Company, St. Louis, Mo., are about to extend their molding and chipping floors 200 feet.

The American Foundry Company, recently incorporated, have located at 135 Herman street, Buffalo, N. Y. The company will make a specialty of castings for automobiles, air cooled and water cooled cylinders and heads of semi-steel by an entirely new method and process of casting. H. C. Caldwell is general manager.

Dienelt & Eisenhardt are building an addition, 34 x 60 feet, to their foundry on Marcher street, Philadelphia, Pa.

The Brown & Sharpe Mfg. Company, Providence, R. I., manufacturers of machinery and tools, advise us that the foundations for their new foundry are being put in, but no time has been set for the erection proper, as the plans for the superstructure have not yet been completed.

The Steel Tired Wheel Company, 71 Broadway, New York City, have let all the contracts and purchased all the machinery required for the additions now being made to their plant at Depew, N. Y.

The plant of the Towanda Foundry Company of Towanda, Pa., has been acquired by the Loetzer Valve Mfg. Company of that city.

The foundry business carried on for the last ten years at Richford, Vt., by H. C. Ayer, with W. S. Foster as general

manager, has been incorporated under the name of the Richford Foundry Company. H. C. Ayer is president, and W. S. Foster, secretary and treasurer.

New equipment is required by the Southern Engine & Boiler Works, Jackson, Tenn. See "Boilers, Engines and Accessories."

The Stowell Mfg. & Foundry Company, South Milwaukee, Wis., will enlarge their malleable iron foundry by an addition 200 x 80 feet, in which will be installed a 10-ton furnace and annealing ovens, thus doubling the present capacity. A new engine room and addition to the machine shop will also be erected. The buildings are expected to be ready for occupation by spring. Other additions are being figured on but not yet settled. All buildings will be up to date in every respect and equipped with the latest and best modern appliances.

Bridges and Buildings.

The Springfield Bridge & Iron Company, Springfield, Ill., have commenced the construction of a new manufacturing and office building, 80 x 120 feet, on Tenth street, which is expected to be completed within six weeks.

Contract has not yet been placed for steel structural work on new buildings of the Southern Engine & Boiler Works, Jackson, Tenn. See "Boilers, Engines and Accessories."

The Colburn Machine Tool Company of Franklin, Pa., are about to erect new buildings. See "General Machinery."

The Brown & Sharpe Mfg. Company, Providence, R. I., have not yet completed the plans for the superstructure of their new foundry. See "Foundries."

The Ferricup Metal Company of Providence, R. I., will erect a new mill.

The Penn Bridge Company of Beaver Falls, Pa., have been awarded a contract for a modern steel tippie, at Whipple, in the New River coal district of West Virginia.

The Columbia Bridge Company, with offices in the Fitzsimmons Building, Pittsburgh, have been awarded a contract for the erection of a bridge and tippie for the Merchants' Coal Company, to be built near Somerset, Pa. About 1000 tons of structural material will be required. The Columbia Bridge Company, whose works are at Carnegie, Pa., are very much crowded with work and are considering the question of removing their plant to some other location, where they will have more room. The Board of Trade of Wheeling, J. F. Adams, secretary, have offered inducements to the concern to locate at Wheeling.

Hardware.

The Automatic Neck Yoke Company, Indianapolis, Ind., report an excellent demand for their productions, one of the more recent shipments being a quantity of carriage yokes to Venice, Italy.

F. G. Umbach, Athens, Ga., manufactures a patent harrow which is intended especially for the requirements of the farmer in the Southern States. It is handled by many of the jobbers and retail merchants in that territory. Sales for the past season were very satisfactory, and a larger quantity is being manufactured for next year in anticipation of an increased demand.

Miscellaneous.

The United States Aluminum Company and the Aluminum Cooking Utensil Company were incorporated last week by interests of the Pittsburgh Reduction Company, makers of aluminum. The companies are to operate in connection with the works at Niagara Falls and New Kensington. Various aluminum specialties are to be produced. The first company have named as their capital \$25,000, the other \$10,000. The incorporators are R. B. Mellon, A. K. Lawrie and Arthur V. Davis of Pittsburgh; R. E. Withers, Jr., Parnassus, and C. M. Hall, Niagara Falls, all connected with the Pittsburgh Reduction Company.

The Electric-Magnetic Brake Company of Pittsburgh will apply for a charter of incorporation. The new company will be subsidiary to the Westinghouse Air Brake Company, and the taking out of a charter is largely a formality. The works of the Westinghouse Air Brake Company at Wilmerding are capable of making the entire output of brakes required by the concern. The incorporators of the Electric-Magnetic Brake Company are H. H. Westinghouse, W. W. Card, E. M. Kerr and John Caldwell, all of the Westinghouse interests.

The Loetzer Valve & Mfg. Company, Towanda, Pa., have acquired the plant of the Towanda Foundry Company, which they have refitted for the manufacture of their new line of valves and supplies, and for doing a general foundry and machine business. The necessary machinery will be installed in about ten days, and they expect to be in the market with their goods by the middle of November.

The Hoffman Engineering Company, Philadelphia, Pa., say that the report that they had let a contract for the construction of a new mill is incorrect.

Thos. Caves & Sons, Philadelphia, Pa., manufacturers of carpets, have taken the building, 50 x 120 feet, four stories, at Third and Huntington streets, which they will annex to their present plant. This annex will be used for the manufacture of rugs.

The Ferricup Metal Company, Providence, R. I., manufacturers of copper or brass coated steel sheets, copper wire, bars and sheets, &c., will build a new mill, the details of which are not yet complete.

A new building, 40 x 115 feet, of brick, three stories, will be erected by the Olympian Knit Goods Company upon a site at Hartford, N. Y., donated by the New Hartford Improvement Company, to which place their plant at Utica will be moved. The machinery will be run by electrical power transmitted from Utica.

The Clearfield Brick Company, Clearfield, Pa., advise us that there is no truth in the report that they will erect a plant at Jersey Shore, Pa.

A large quantity of machinery has arrived for the new plant of the Ordway Mfg. Company, at Bristol, Tenn., which is now under construction. The company will erect a large electric plant as a feature of the enterprise, to furnish electric power to other plants.

The American Dredging Company, Camden, N. J., will erect a two-story pattern and mold storage house, 35 x 70 feet.

The Burger plant of the American Can Company, at Jersey City, N. J., was last week destroyed by fire. The loss on building, stock and machinery, which included that of the Beggs Can Company, recently moved to the Burger plant, is about \$70,000. The property was insured for \$40,000.

The Combined Locks Paper Company, Combined Locks, Wis., are building an addition to their plant, to contain four large grinders. The new building will be completed in 60 days. The Dayton Globe Iron Works are furnishing the grinders and the Jas. Leffell Company the wheels.

A new plant is being erected at Portsmouth, Va., by the Piedmont Mfg. Company, who have been incorporated with a capital stock of \$25,000, for the purpose of manufacturing underwear. L. B. Whatley is president.

The Federal Chemical Company have been organized to manufacture and deal in fertilizers of every character. They will both build and acquire such additional plants in the future as may be necessary. Several plants have already been acquired, among which are the Globe Fertilizer Company, Louisville, Ky.

The Eldridge Sugar Company, Orange Park, Fla., are preparing to establish a large mill. George A. Chipman of Boston, Mass., is president, and J. F. Eldridge of Orange Park, Fla., is treasurer.

The E. O. Standard Milling Company, Alton, Ill., lost their entire plant by fire last week. The insurance is \$204,000, which is about the amount of damages. They have not yet decided whether they will rebuild.

The Kalamazoo Stove Company, Kalamazoo, Mich., will build a two-story factory, 350 x 120 feet, all walls to be of concrete, with separate power house, 42 x 62 feet. The equipment will be modern in every particular, all machinery being run by electric motors. The company expect to start up early in January, making a specialty of sheet steel ranges and stoves.

The Monarch Electric Company, 412-414 Equitable Building, Baltimore, Md., have been incorporated for the purpose of promoting the general electrical supply and contracting business of C. D. Boyle & Co. It is their intention, later on, to erect a plant for the manufacture of electric novelties, specialties and general supplies. The officers are W. R. Carpenter, president; Raleigh T. Lilley, vice-president, secretary and treasurer, and C. D. Boyle, manager.

The Neafie & Levy Ship & Engine Building Company, Philadelphia, Pa., successfully launched on the 26th inst. the torpedo boat destroyer "Chauncy," the second of the three being built by this company for the United States Government, the "Bainbridge" having been launched some time ago, while the "Barry" is still on the stocks, and it is expected will be put in the water at an early date. The "Chauncy" was launched, as was the "Bainbridge," with her engines and boilers in place, and with most of her permanent equipment excepting her armament. These three vessels are all of the same dimensions and detail—245 feet long and 23 feet beam, the contract speed is 20 knots per hour, which, it is said, has been exceeded by the "Bainbridge" in unofficial trials.

The business men of Sharpsburg, Pa., which is a suburb of Pittsburgh, have organized a Board of Trade and will try to induce manufacturing concerns to locate there. Sharpsburg already has one large manufacturing concern, this being the mills of the Moorhead Brother & Company, who roll iron skelp and plates.

The British Admiralty has ordered the construction at the Government dock yard at Devonport of a battle ship larger than any now existing. The vessel will be 16,500 tons and her length 425 feet. She will be the first of the new "King Edward" class of battle ships.

The Iron and Metal Trades.

There has been some discussion among Southern makers of Pig Iron of the expediency of announcing a further increase in the price of Pig Iron of 50c. per ton. Conservative councils have prevented, however, and it was decided to let well enough alone. There is a steady stream of buying orders in moderate quantities, widely distributed, for delivery up to February, indicating confidence in the manufacture, but showing little disposition on the part of buyers to contract far ahead, except when it is necessary to stock up in anticipation of the closing of navigation. Among the larger buyers during the week have been the Cast Iron Pipe interests, one Southern plant taking 8000 tons. In the Pittsburgh district the buying has been very heavy, the sales being upward of 40,000 tons of Foundry Iron.

As bearing on the question of the magnitude of the consumption, the position in the Cast Iron Pipe trade is significant, because this interest is little affected by what may be doing in Wall Street. The flow of moderate sized orders for prompt delivery has been exceptional for this season of the year, even when due allowance is made for the weather, which has been favorable for outside work. Never in the history of the Pipe trade have conditions been more favorable. Usually at this time the shops plan their winter work of casting Pipe for stock, in anticipation of the spring rush. This year it has not been given a thought. The leading municipalities are coming into the market, too, unusually early. New York has just called for about 9000 tons and Boston will soon be in the market for an even larger amount.

The Steel situation shows little change. Those who are caught with belated deliveries or without covering contracts are paying such premiums that the question of building Steel works is obtruding itself. A significant transaction has been the sale of German Basic Steel for delivery west of Pittsburgh, with more business pending.

Prices for Finished Iron and Steel, while very remunerative, do not thus far appear to have had the slightest effect in checking consumption. Still, a hint in that direction is conveyed in the reports of the Western Bar trade. That same branch in the East is beginning to complain of a slackening volume of work.

In at least one line which was affected by the strike, in Sheets, deliveries are becoming prompter. In others, notably in Tin Plates, many stories are current of orders unfilled for which specifications were put in as early as May.

The outlook for Structural work is bright. A heavy tonnage has already been booked, and a good deal of work is in sight. Thus three bridges over the Monongahela will require over 20,000 tons of material.

On the Lakes a number of orders for ships have been booked, and the yards are full to overflowing.

In the Copper trade there is substantial unanimity of opinion as to the strength of the market. This is not surprising, since the Amalgamated is restricting production and maintaining the price, while other large interests are running full. The latter will give enthusiastic approval to the situation while it lasts. The experiment will be watched by the whole metal trade as bearing upon the question whether any of the great modern consolidations can hold any market by main force against adverse conditions.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

	Oct. 30, 1901.	Oct. 23, 1901.	Oct. 2, 1901.	Oct. 24, 1900.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	\$15.00	\$15.00	\$14.90	\$15.00
Foundry Pig, No. 2, Southern, Cincinnati	13.75	13.75	13.75	12.25
Foundry Pig, No. 2, Local, Chicago	14.75	14.75	15.00	14.50
Bessemer Pig, Pittsburgh	16.00	16.00	15.75	13.00
Gray Forge, Pittsburgh	14.10	14.15	13.75	12.25
Lake Superior Charcoal, Chicago ..	17.00	17.00	17.00	18.00

BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh (nom)....	27.00	27.00	26.50	16.75
Steel Billets, Philadelphia (nom)...	28.00	28.00	27.50	20.00
Steel Billets, Chicago, (nom).....	19.50
Wire Rods (delivered).....	35.00	34.00	35.50	33.00
Steel Rails, Heavy, Eastern Mill..	28.00	28.00	28.00	26.00
Spikes, Tidewater.....	1.80	1.80	1.80	1.45
Splice Bars, Tidewater.....	1.50	1.50	1.50	1.25

OLD MATERIAL, PER GROSS TON:

O. Steel Rails, Chicago.....	14.00	14.00	13.50	10.50
O. Steel Rails, Philadelphia.....	17.25	17.50	16.75	14.00
O. Iron Rails, Chicago	21.00	21.00	21.00	16.00
O. Iron Rails, Philadelphia.. ..	21.00	20.00	19.50	16.50
O. Car Wheels, Chicago	16.50	16.00	16.00	15.50
O. Car Wheels, Philadelphia (nom).	15.00	16.50	16.50	16.50
Heavy Steel Scrap, Chicago.	13.50	13.50	13.00	10.00

FINISHED IRON AND STEEL, PER POUND:

Refined Iron Bars, Philadelphia...	1.65	1.65	1.62½	1.25
Common Iron Bars, Chicago.	1.70	1.70	1.65	1.35
Common Iron Bars, Youngstown..	1.55	1.60	1.50	1.25
Steel Bars, Tidewater.....	1.62½	1.62½	1.65	1.20
Steel Bars, Pittsburgh	1.55	1.60	1.50	1.10
Tank Plates, Tidewater.....	1.75	1.75	1.75	1.30
Tank Plates, Pittsburgh.....	1.60	1.60	1.60	1.10
Beams, Tidewater.....	1.75	1.75	1.75	1.65
Beams, Pittsburgh.....	1.60	1.60	1.60	1.50
Angles, Tidewater.....	1.75	1.75	1.75	1.55
Angles, Pittsburgh.....	1.60	1.60	1.60	1.40
Skelp, Grooved Iron, Pittsburgh..	1.80	1.85	2.00	1.40
Skelp, Sheared Iron, Pittsburgh..	1.85	1.90	2.05	1.50
Sheets, No. 27, Pittsburgh.....	3.00	3.05	3.25	2.80
Barb Wire, f.o.b. Pittsburgh.....	2.90	2.90	2.90	2.80
Wire Nails, f.o.b. Pittsburgh.....	2.25	2.30	2.30	2.30
Cut Nails, Pittsburgh.....	2.05	2.05	2.05	1.95

METALS:

Copper, New York.....	16.85	16.85	16.50	16.75
Spelter, St. Louis	4.12½	4.10	3.95	4.00
Lead, New York.....	4.37½	4.37½	4.37½	4.37½
Lead, St. Louis.....	4.25	4.25	4.25	4.22½
Tin, New York.....	24.85	24.75	24.25	27.10
Antimony, Hallett, New York ...	8.50	8.50	8.50	9.50
Nickel, New York.....	60.00	60.00	60.00	55.00
Tin Plate, Domestic Bessemer, 100 lbs., New York.....	4.19	4.19	4.19	4.19

Chicago.

FISHER BUILDING, October 30, 1901.—(By Telegraph.)

The firmness developed in Iron Bars has checked the demand to some extent. The usual proportion of inquiries do not become orders, and the buying is for moderate lots. With this exception the market for finished products is fully as active as the gratifying conditions of the past several weeks. Makers of Merchant Steel are declining to quote prices of product for delivery during the first half of next year, and there is a brisk call for other manufactured Steel. Specifications on old contracts are generally reported to be excellent, and all circumstances point to a very large consumption. Mild weather is protracting the season for active outdoor operations, and sales of Pipe, which usually drop off about this time, continue large. The car famine is a serious obstacle to trade, and is not growing any easier. The lack of fuel is felt widely, and Coke receipts are considerably below current needs.

Pig Iron.—This shortage of Coke has local illustration this week. The second blast furnace of the Iroquois Iron Company, at South Chicago, which has been under construction for 18 months, is now ready to be put into blast, but operations are delayed because there is not enough Coke procurable to insure steady operations. The market for Pig Iron may be slightly less active than the previous week, but remains more than fairly brisk.

Among the orders placed are the renewals of some annual contracts which were placed just a year ago, the week before the Presidential election of 1900 being remarkably active in Pig Iron circles at Chicago. It is noticeable, also, that much of the present buying comes from consuming interests closely related to the car builders and the railroads. The Car Wheel foundries have been very active and large buyers of Pig Iron and some of the contracts run through the entire year 1902, and the car builders themselves have been good buyers. The business of the week has been well distributed. Some of the local furnaces are now sold so far ahead that they will soon be out of the market for deliveries during the first half of 1902. Prices are steady, as follows:

Lake Superior Charcoal.....	\$17.00 to \$18.00
Local Coke Foundry, No. 1.....	15.25 to 16.00
Local Coke Foundry, No. 2.....	14.75 to 15.25
Local Coke Foundry, No. 3.....	14.25 to 14.75
Local Scotch, No. 1.....	15.25 to 16.00
Ohio Strong Softeners, No. 1.....	17.00 to 17.50
Southern Silvery, according to Silicon.....	15.65 to 16.00
Southern Coke, No. 1.....	15.15 to 15.40
Southern Coke, No. 2.....	14.40 to 14.65
Southern Coke, No. 3.....	13.90 to 14.15
Southern Coke, No. 1 Soft.....	15.15 to 15.40
Southern Coke, No. 2 Soft.....	14.40 to 14.65
Foundry Forge.....	13.40 to 13.65
Southern Gray Forge.....	13.15 to 13.40
Southern Mottled.....	13.15 to 13.40
Southern Charcoal Softeners, according to Silicon.....	15.50 to 16.50
Tennessee Silicon Pig.....	16.40 to 16.65
Alabama and Georgia Car Wheel.....	19.50 to 20.50
Malleable Bessemer.....	15.75 to 16.00
Standard Bessemer..... to 17.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	15.75 to 16.25

Bars.—Sellers of Bars incline to the opinion that prices will rise slightly. Buyers on the other hand think the present range will not be maintained, especially as it relates to Iron product. These diverse views give the market a halting condition, which is not in harmony with consumption. Transactions are usually for quantities below 200 tons, and for deliveries not very remote. But there is no falling off in the specifications on old contracts, and deliveries on the same are more than likely to be delayed. At store there is much complaint of tardy shipments from mill. Mill shipments remain unchanged at 1.70c. for Common Bar Iron and 1.65c. for Soft Steel Bars. From stock quotations are 2c. for Common Iron; 1.90c. to 2c. for Steel Bars, and 2.50c. for Steel Hoops.

Structural Material.—There is talk of a number of local railway stations to be erected, but no contracts have been placed. Trade in Shapes is excellent for small and medium sized lots, and deliveries are slow. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—Inquiry for Plates this week shows improvement. The demand is for moderate amounts, but the inquiries are numerous. Fairly good deliveries are promised. Mill shipments are quoted as follows: Tank Plate, ½-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c.; Marine, 1.95c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank, and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—The Sheet supply improves slowly. Some jobbers are now receiving fairly good shipments from mill, but the rule is for stocks to continue broken. The demand is above the supply and values from store recede with great deliberation. No. 27 Common is quoted at 2.75c. to 2.85c. by the more fortunate possessors of stock. Galvanized is slightly lower, 65 and 10 being a common quotation. The scarcity in Tin Plates continues, Terne Plates becoming easier.

Merchant Pipe.—The continued open weather is helping the trade in some directions. Business for the season usually winds up about November 1, but there are indications of a week or two of fairly good trade yet. Carload lots are now quoted as follows, random lengths: Black, ⅜ to ½ inch, 60 off; ¾ to 10 inches, 67 off; Galvanized, ⅜ to ½ inch, 47 off; ¾ to 6 inches, 55 off.

Boiler Tubes.—The demand is notably brisk, and there is no change in prices. Quotations are as follows:

	Steel.	Iron.
2½ to 3 inches.....	57½	47½
1½ to 2½ inches.....	50	40
1 to 1½ inches.....	35	30
6 inches and larger.....	52½	45

Rails and Track Supplies.—There is no ceasing in the inquiry for Rails, but the prospective buyers are looking for deliveries in the early spring. They find others have preceded them in engagements of that time and after shopping around accept the inevitable. Standard Sections continue at \$28, and Light Rails at \$30 and upward. All makers of Fasteners are meeting with a good demand, and product is well sold into the coming year. Track Fastenings are quoted as follows: Splice Bars, 1.65c. to 1.75c.; Spikes, 2c. to 2.10c.; Track Bolts, with Hexagon Nuts, 2.90c. to 2.95c.; Square Nuts, 2.75c. to 2.80c.

Merchant Steel.—Manufacturers of Merchant Steel are declining to consider some good inquiries for shipments during the first half of 1902, their order books showing as much tonnage as they can reasonably expect to fill. For prompt shipment no steel is procurable. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 6¼c. for carloads and 7c. to 7½c. from store; Specials, 12c. upward.

Old Material.—Buying is restricted. Railroad offerings are selling a little lower than a month ago, and these offerings are going more generally directly to consumers. Offerings from dealers continue generous, with relative few takers. Bids made are usually considerably below current levels. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$21.00 to \$21.50
Old Steel Rails, mixed lengths.....	14.00 to 14.50
Old Steel Rails, long lengths.....	18.00 to 18.50
Heavy Relaying Rails.....	25.50 to 26.00
Old Car Wheels.....	16.00 to 16.50
Heavy Melting Steel Scrap.....	13.50 to 14.00
Mixed Steel.....	10.50 to 11.00

The following quotations are per net ton:

Iron Fish Plates.....	\$17.50 to \$18.00
Iron Car Axles.....	21.00 to 21.50
Steel Car Axles.....	16.50 to 17.00
No. 1 Railroad Wrought.....	15.50 to 16.00
No. 2 Railroad Wrought.....	13.50 to 14.00
Shafting.....	16.50 to 17.00
No. 1 Dealers' Forge.....	13.00 to 13.50
No. 1 Bushelling and Wrought Pipe.....	11.50 to 12.00
Iron Axle Turnings.....	11.25 to 11.75
Soft Steel Axle Turnings.....	10.50 to 11.00
Machine Shop Turnings.....	10.50 to 11.00
Cast Borings.....	5.00 to 5.25
Mixed Borings, &c.....	5.25 to 5.50
No. 1 Boilers, cut.....	11.00 to 11.50
No. 2 Boilers, cut.....	9.50 to 10.00
Heavy Cast Scrap.....	11.25 to 11.75
Stove Plate and Light Cast Scrap.....	8.50 to 9.00
Railroad Malleable.....	12.00 to 12.50
Agricultural Malleable.....	11.00 to 11.50

Metals.—Buyers of Copper are confining their transactions to medium quantities. There is, however, continued confidence in the maintenance of present prices. Carload lots of Lake are held at 17c., and Casting brands at 16½c. Pig Lead stands steadily at 4.32½c. for Desilverized and 4.42½c. for Corroding, in 50-ton lots. Dealers continue to quote selling prices on small lots of Old Metals as follows: Copper Wire and Heavy, 15c. to 15½c.; Copper Bottoms, 14c.; Pipe Lead, 4.15c.; Zinc, 2.75c.

Coke.—If there is change, Coke is scarcer. Prices of West Virginia product have advanced 25c. and Standard brands of Connellsville Foundry Coke are strong at \$4.75 to \$5. It is not uncommon for premiums to be paid for prompt shipments. Receipts are light, and there are many buyers.

On Friday, October 25, a large party of Pennsylvania officials, headed by A. J. Cassatt, president, together with a number of leading officials of the Cambria Steel Company, visited the plant of that concern at Johnstown, Pa. This is the first official visit of the Pennsylvania Railroad interests since the controlling interest in the stock of the Cambria Steel Company was acquired by that corporation.

Philadelphia.

FORREST BUILDING, October 29, 1901.

Reports from all quarters continue to be of a favorable character—plenty of orders, steady to firm prices, and many optimistic predictions in regard to next year's business—"a consummation devoutly to be wished." With such a variety of opinions in regard to the future, however, the remarks in this article will, so far as possible, be confined to present conditions, although the present and the future are so closely allied that it is difficult to discuss the situation thoroughly without stepping over the line a little bit anyway. Referring strictly to the remainder of the year, it may be said that there hardly ever was a time when business was so eminently satisfactory as it is to-day. Every line of business engaged in the manufacture and the consumption of Iron and Steel is working to the fullest extent possible, and under such circumstances it would be useless to borrow trouble, which, after all, may never come, although it may be that some people borrow it because it is the only thing that can be borrowed without good collateral. Nevertheless, this condition of prosperity is regarded by many as the greatest danger that the trade is likely to meet. There is really no very strong reason for the opinion that trade is going to fall off to any alarming extent. The loss of an export demand equivalent to 1,000,000 tons of Pig Iron a year is, of course, an item of some importance, but that does not cover the whole ground. The increase in production, the result of the recent as well as the present unparalleled prosperity, is the crucial point. That will have to be met early in 1902, but whether it can be met successfully or not remains to be seen. There is no need to close one's eyes to the fact that business at the present time is phenomenally prosperous; on the other hand, it is neither wise nor prudent to disregard what the developments in the future are likely to be, a point upon which there is great diversity of opinion.

Pig Iron.—Business continues on a surprisingly large scale, considering that the closing month of the year is near at hand. The situation is really remarkable, and appears to be much stronger than the most pronounced optimist would have predicted three months ago. Dealing with conditions as they exist to-day, it is certain that business is in fine shape, and there is nothing to indicate anything less favorable in the near future, but in spite of that there is an undertone of doubt and hesitancy in regard to long contracts which is in marked contrast to the "snappy movement" in spot and other short deliveries. What people want they buy, and no more; but their wants are large enough to take all that can be made, so that for the time being it is a neck and neck race. One or the other must fall behind soon, and, with steadily increasing capacity for production, there is at least a possibility of danger from this source even if consumption is maintained on the same scale as at present. There is a marked disposition to avoid long date contracts, however, although manufacturers claim that they are perfectly satisfied to wait, which, of course, is an easy matter as long as they can get no Iron ahead, but have, instead, from 8 to 10 or 12 weeks of their capacity engaged all the time. The past week has somewhat strengthened sellers, as sales have included almost every grade that is made. Small lots of the best qualities of Iron have sold at very full prices, while at the inside figures very little has been done, the great bulk having been at medium or a little better than medium prices, particularly when quick deliveries are specified. Something has also been done in Basic, Bessemer and Low Phosphorus, with some little business in low priced Foundry Irons for Pipe foundries, &c. The general range of the market may be quoted about as follows for Philadelphia and nearby points, and 25c. to 50c. less for deliveries within a radius of 100 miles south or west: No. 1 X Foundry, \$15.50 to \$16; No. 2 X Foundry, \$15 to \$15.50; No. 2 Plain, \$14.60 to \$14.75; Standard Gray Forge, \$13.75 to \$14; Ordinary Gray Forge, \$13.25 to \$13.50; Basic (Chilled), about \$14; Bessemer, nominal, at about \$15.

Billets.—The scarcity of Steel for early shipment is more pronounced than ever. Prices are unquotable, but \$28 to \$30 appears to be the extreme limit at both ends, depending upon date and point of delivery. Outside lots, however, are occasionally picked up at a great deal less money, particularly when the purchase extends well into the new year.

Muck Bars.—Not much doing, but prices are steady at about \$27, f.o.b. cars sellers' mills.

Plates.—The demand is fair and mills seem to capture a good deal of work in a quiet way, but there is no difficulty in getting reasonably prompt shipments. There is a great deal of work on the books, however, and there is good reason for expecting that there will be plenty of business during the winter months. Prices are about as follows for Philadelphia and nearby deliveries: Universals, 1.75c. to 1.80c.; Sheared, 1.75c. to 1.80c.; Flange, 1.85c. to 1.95c.; Fire Box, 1.95c. to 2.05c.; Marine, 1.95c. to 2.05c.

Structural Material.—There is no necessity for changing the tone of the reports of the past several months. Deliveries are very far behind, with but little prospect of catching up for a long time to come. Prices nominally as follows for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch upward, 1.75c. to 1.85c.

Bars.—There is not as much demand as there was some time ago and some of the mills are beginning to run rather close to the end of their order books. Prices are well maintained, however, and in this respect there is not much prospect of change, Iron Bars being 1.65c. to 1.70c. and Steel Bars 1.62½c. to 1.65c. for carload lots as a minimum.

Sheets.—The demand is not as pressing as it was during the summer months, but there is plenty of business to be had if any of the mills want it. There are a great many back orders, however, and it will require a long time before they can be thoroughly cleaned up. Prices slightly easier, but in ordinary cases quotations are about as follows for best Sheets (common Sheets two-tenths less): No. 10, 2.50c.; No. 14, 2.70c.; No. 16, 2.80c. to 2.90c.; Nos. 18-20, 3.40c.; Nos. 21-24, 3.50c.; Nos. 26, 27, 3.65c. to 3.70c.; No. 28, 3.80c. to 4c.

Old Material.—The market is very irregular, some things up and some down; all depends on circumstances. Steel is easier; Iron Rails, Axles, &c., are scarce and command very high prices. Bids and offers for deliveries in buyers' yards are as follows: Choice Railroad Scrap, \$19 to \$20; Country Scrap, \$15.00 to \$17; No. 2 Light (Ordinary), \$12 to \$12.50; No. 2 Light (Forge), \$13.75 to \$14.50; Machinery Cast, \$13.75 to \$14.25; Heavy Steel, \$17.25 to \$17.50; Old Steel Rails, \$17.25 to \$17.50; Old Iron Rails, \$21 to \$21.50; Wrought Turnings, \$11.75 to \$12.50; Cast Borings, \$7.75 to \$8; Old Car Wheels, nominal, at about \$15; Iron Axles, \$23.50 to \$24; Steel Axles, \$19 to \$20.

Cleveland.

CLEVELAND, OHIO, October 29, 1901.

Iron Ore.—Several advances in carrying rates have been made in succession during the past week, and others are expected to follow. The Duluth rate now figures up at \$1.10 to Ohio ports, and the Escanaba rate to Ohio ports is variously quoted at from 70c. to 80c.; the mean being, however, nearer the market. Thus far there has been no change in the rates out of Escanaba, because the wild offers from that port are not very heavy. The spurt at this time is difficult to explain, since the amount of wild Ore yet to be moved is comparatively small and the boats are abundant, or will be at the expiration of the contract season about the middle of November. The movement of both wild and contract boats is retarded very seriously now by the lack of cars for the direct movement between the lower lake docks and the furnace stock piles. The frequent delays are making it apparent that the year's movement will not aggregate more than was carried down the lakes last season.

Pig Iron.—The buying of Pig Iron of the Foundry grade for immediate or approximately immediate de-

livery is only limited by the amount of material of which to make disposition. The furnaces are beset with the twofold unpleasantness of not being able to meet the demands of the trade, and of not being able to make deliveries when the material is on hand, because the railroads cannot furnish the equipment necessary for the transportation of the material. In Pig Iron circles the statement is made that the entire output of the furnaces in this district has been sold up until the first of the year. The prices are looking up some.

Finished Material.—The market has been running on an even keel all week, with a good brisk business devoid of sensational features. The producers speak of orders coming in steadily on all grades, except Plates, and even in that the demand is picking up some. The Bar mills are reporting that the conditions have been relieved some, and that deliveries are now possible in shorter time than since the beginning of the strike of the Amalgamated Association. Bar Iron is quoted at 1.55c., Pittsburgh; Bessemer Bar Steel at 1.50c., and Open Hearth Bar Steel at 1.60c., Pittsburgh. The Plate trade is somewhat quiet, due more to the light specifications on former orders than to a lack of new business, although it is confessed by the Steel producers that the orders have not been placed as far ahead as some of the other grades. The easy conditions pertain more especially to Sheared Plates. The lighter Plates, and those which are capable of being rolled in the universal mills, are in fair demand and, in fact, Light Plates are as scarce as any other grade of Finished Steel. The price holds firm, there being no disposition to shade 1.70c. The buying of Steel Rails keeps up by roads in this territory, and the mills are adding to the orders on the books, until future deliveries are to be a question, since such vast amounts of material are to be carried over from this year to be delivered next season. The price holds at \$28. Billets are selling well up, and the Association price is being lost sight of. This week some large Billets have been sold at \$29, with a few lots going in at \$30. The market is dull in small Billets, not from a lack of demand for them, but because the mills have none to sell. The price holds nominally at \$30, but it is agreed that premiums would gladly be paid if the material were forthcoming. The demand for Structural Material is quite lively, and the market is showing up strong, with prices remaining unchanged. Sheets are in good demand, with deliveries becoming harder to obtain, as the capacity of the mills is sold up for a number of weeks ahead.

Old Iron.—The Scrap trade is in a healthy condition, and the sales this week have aggregated a satisfactory amount. The prices hold firm at the old figures. The quotations therefore are: No. 1 Wrought, \$16.50, net; Cast Borings, \$8 gross; Wrought Turnings, \$12.25 gross; Cast Scrap, \$13, net; Stove Plate, \$10, net; Heavy Steel, \$17 gross; Steel Rails, \$17 gross; Old Iron Rails, \$22 gross; Old Steel Axles, \$19 gross; Old Car Wheels, \$17 gross.

Cincinnati.

FIFTH AND MAIN STS., October 30, 1901.—(By Telegraph.)

If we bar a good sized complaint regarding car service we will find the Pig Iron people in a state of serenity which is exceedingly satisfactory. There has been a continuation of the same conditions which have prevailed throughout the entire month. Trade has been good, and many furnaces are now pretty well sold up for the first quarter of next year. Stock for prompt shipment is exceedingly scarce. There has been no change in prices, and not much disposition is shown to advance from the present basis. A few furnaces are asking an advance on some special Irons, and have no trouble in securing it, but the quotations in the main are very steady on the same basis as a week ago. October closes with the record of having been the most satisfactory month, taking everything into consideration, that the trade has experienced in at least a decade. The outlook is for a good, steady market. Freight from Birmingham is \$2.75 to this point; from Hanging Rock district, \$1.10. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	to \$14.25
Southern Coke, No. 2	to 13.75
Southern Coke, No. 3	to 13.25
Southern Coke, No. 4	to 12.75
Southern Coke, No. 1 Soft	to 14.25
Southern Coke, No. 2 Soft	to 13.75
Southern Coke, Gray Forge	to 12.75
Southern Coke, Mottled	to 12.75
Ohio Silvery, No. 1	\$15.10 to 15.60
Ohio Silvery, No. 2	14.60 to 15.10
Lake Superior Coke, No. 1	15.10 to 15.60
Lake Superior Coke, No. 2	14.60 to 15.35
Lake Superior Coke, No. 3	14.10 to 14.85
Southern Basic	to 14.75

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades	\$18.25 to \$18.75
Standard Southern Car Wheel, No. 2	17.25 to 17.75
Lake Superior Car Wheel and Malleable	18.50 to 19.00

Plates and Bars.—The market is strong and steady on an unchanged basis. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.67c. to 1.70c., with half extras; same, in small lots, 1.85c. to 1.90c., with full extras; Steel Bars, in carload lots, contract delivery, 1.65c.; same for prompt delivery, 1.75c. to 1.80c.; Base Angles, in carload lots, 1.90c.; Plates, ¼-inch and heavier, 1.90c. to 2c.; 3-16 inch, 2.10c.; Sheets, No. 16, 2.90c. to 3c.

Old Material.—Conditions continue satisfactory in the main, and prices practically as they have been for a few weeks past. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, per net ton, \$14 to \$14.75; Cast Railroad and Machine Scrap, \$12.25 to \$12.75; Iron Axles, \$19 to \$20; Iron Rails, \$17.25 to \$18.25; Steel Rails, rolling mill lengths, \$14.75 to \$15.25; short lengths, \$13.75 to \$14; Car Wheels, \$16 to \$17. All prices except No. 1 Wrought on the basis of gross tons.

St. Louis.

CHEMICAL BUILDING, October 30, 1901.—(By Telegraph.)

Pig Iron.—There is no noticeable change in the heavy and urgent requirements in the Pig Iron market and several furnaces are reported to be sold right up for the first half of 1902 on certain grades. The transportation problem seems to be causing increasing uneasiness and it is difficult to make shipments anywhere near on time. Every mail with some of the large concerns brings complaints on account of this delay, and it seems to be a vain effort on the part of the railroad managers to improve conditions in this direction. It is the feeling that the tonnage which will likely come in the market about January 1 will be very heavy, and, unless shipping conditions improve, it is feared greater trouble and annoyance than now will be experienced. We quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	\$14.75 to \$15.00
Southern, No. 1 Foundry	14.00 to 14.25
Southern, No. 3 Foundry	13.50 to 13.75
Southern, No. 4 Foundry	13.00 to 13.25
No. 1 Soft	14.50 to 14.75
No. 2 Soft	14.00 to 14.50
Gray Forge	13.00 to 13.25

Bars.—Nothing new can be reported in this branch of the market, the demand and inquiry still continuing to be exceptionally heavy. It is hoped by the efforts being shown on the part of the mills to eclipse all past records for quantity of work turned out that they can in this way clear up all deliveries promised by January 1. We quote: Iron Bars, 1.75c. to 1.85c.; Steel Bars, 2c. Jobbers quote Iron Bars 2.10c. to 2.15c.; Steel, 2.10c. to 2.15c., full extras.

Rails and Track Supplies.—The demand and inquiry for Rails is said to be remarkably large. With production booked so many months ahead, new and urgent requirements stand small chance of being filled by the large Rail mills with any degree of promptitude. The active and strong demand for Track Supplies continues, with prices remaining the same. We quote: Splice Bars, 1.75c. to 1.95c.; Bolts, with Square Nuts, 2.75c. to 2.90c.; with Hexagon Nuts, 2.90c. to 2.95c.; Spikes, 2c. to 2½c.

Pig Lead.—The favorable demand for Pig Lead continues and marked steadiness in price rules, Soft Missouri at 4.25c. to 4.25½c. and Chemical at 4.30c. to 4.35c.

Spelter.—The demand for Spelter continues and 4.12½c. is said to be bid, with light offerings at this figure.

Sheets.—There is an active demand for all grades

and sizes of Sheets. The same old difficulty to keep stocks complete is complained of, but an improvement in the matter of delivery from the mills is now felt. Jobbers quote for $\frac{1}{4}$ -inch and heavier 2.10c. to 2.20c.; stove pipe size of Black Sheets, 3.90c. to 4c.; Galvanized Sheets, 65 off.

The Bartlett Steel Company of Joplin, Mo., were organized October 11, 1901, taking over the business of John L. Bartlett. The company's business is that of jobbers in Structural Steel, Bar and Sheet Iron, Tool and Drill Steel, Castings, &c., and their salesmen will cover the territory in Southwestern Missouri, Kansas, Arkansas, Indian Territory, Oklahoma Territory and Texas. The officers are: Eayre O. Bartlett, president; John W. Harris, vice-president; Jerome B. Grigg, treasurer, and John L. Bartlett, secretary.

Birmingham.

BIRMINGHAM, ALA., October 28, 1901.

There was no change in market conditions concerning Iron the past week. Perhaps the healthy condition of affairs was more emphasized. That was all. There was some talk of an advance, but it did not materialize. Prices, though, were very firm and sellers were indifferent about placing product. Trades are much easier made than when prices were materially lower. On his rounds your correspondent dropped into an office just as a buyer called by telephone, "I want some No. 4 Foundry." Seller responded, "Can let you have 1000 tons November and December." "But I want 2000 tons." "Can't supply you," said the seller. "The 1000 tons will exhaust us." "Very well, I will take it. Now what is the price?" The seller responded, "Ten dollars." "Very well," said the buyer, "enter the order." This illustrates the fact that these letters of late have tried to make prominent—viz., that the buyers found more difficulty in supplying their wants than sellers did in obtaining their price. In conversation with a leading official the remark was made, "I am giving currency to the assertion that the output of this district will not be increased this year." He replied, "You are right. We are working on that supposition. You can with perfect safety say also that the Iron situation in this district has never been more satisfactory. There is no trouble to sell all we care to sell, and the time of delivery is gradually being extended further and further into 1902." Quotations are on the basis of \$11 for No. 2 Foundry. At the close of the week some Pipe works came in and took about 8000 tons of No. 4 Foundry. The orders were scattered among the various grades and among the leading interests the volume of sales materially exceeded the output. Shipments are just what the railroads can furnish transportation for. There is still a great cry for cars, and railroad officials, though straining every nerve, have not succeeded in relieving the situation. Nor will they do it until they largely increase their car equipment. It seems an exaggeration to state that 72 per cent. of the transportation handled by the railroads in Alabama is furnished by the mineral belt. But it is a fact. Concerning Steel there is little to say. The output is large and the quality more uniform and the market with outstretched hands is glad to take it. Two additional Open Hearth furnaces will in the near future be added to the productive capacity of the mill and aid in feeding full rations to the Blooming mill.

The Alabama Steel & Wire Mill are running wide open with double shifts and have all they can do.

The past week we had among us the committee appointed by the British Iron Association to investigate the American Iron trade. They had very little to say for publication beyond the expression of appreciation of courtesies received, but in private they expressed in unstinted terms their surprise at the lavish endowment of this district by nature and emphatically declared that the progress so far attained was but the precursor of what was to follow and make this one of the leading centers of the Iron Industries of the world. How could we do otherwise than vote that the committee had sound discrimination and ripe judgment?

The Coal situation is very healthy. Price depends on the reputation of the seam, and varies for run of the mine from \$1 to \$1.10 at the mine and unscreened.

Pittsburgh.

HAMILTON BUILDING, October 30, 1901.—(By Telegraph.)

Pig Iron.—The strongest department of the whole Iron trade is Pig Iron, and it is estimated that the entire stocks in the whole country do not represent a ten days' supply. Bessemer Iron is very strong and a good deal is changing hands. The United States Steel Corporation are reported to be figuring on the purchase of a round lot of Bessemer Iron, say 50,000 tons, for December shipment. There is only a fair inquiry for Forge Iron. Foundry Iron is extremely active and there have been heavy sales for deliveries running through the first half of next year. The buying is general and small foundries that usually buy only a few tons at a time are placing orders for 300 to 500 ton lots. It is estimated that from 40,000 to 50,000 tons of Foundry Iron have been sold for delivery in this district in the next six to eight months. Prices have advanced sharply and No. 2 is \$15 minimum, with sales reported as high as \$15.25 to \$15.50. We quote Bessemer Iron at \$15.25, Valley furnace, or \$16, Pittsburgh. It is possible that for prompt Bessemer Iron 10c. to 15c. a ton more might be obtained. We quote Northern Forge Iron from \$14.10 to \$14.25, Pittsburgh. We note a sale of 250 tons at \$14.15. There is not much incentive now for furnaces to make Forge Iron as Foundry is from 75c. to \$1 a ton higher and costs no more to make than mill. We quote No. 2 Foundry Iron at \$15 to \$15.50 and No. 1 at \$15.50 to \$16, Pittsburgh.

Steel.—An item of much interest in the Steel market is that a local concern have just imported a round lot of Basic Bessemer Billets from Germany and for shipment west of Pittsburgh. Conditions attached to this transaction were very favorable, prices of Steel in Germany being low and favorable ocean freights having been obtained. The transaction was very satisfactory to both buyers and seller, and as a result further negotiations are on for the importation from Germany of a round lot of Sheet Bars, and which will likely be put through. High premiums continue to be paid for prompt Steel, and we quote ordinary 4 x 4 Bessemer Billets at \$27 to \$27.50, Pittsburgh. Above \$28 has been obtained for small lots of Billets for prompt shipment and of undesirable sizes to roll. Contracts for Billets for delivery in first quarter and first half of next year could probably be placed at \$24 to \$24.50, maker's mill. Sheet Bars are held at about \$28, maker's mill, but shipments on old contracts are being made at lower prices.

Rails.—Amount of tonnage booked in Rails for next year is greatly exaggerated in the daily press. It is probable that with old and new orders the Rail mills have about 1,200,000 tons booked on which to enter the new year. This will give steady work to the mills for six months. A prominent official of a Rail concern denies that the price will be advanced to \$30. We quote at \$28, at mill.

Muck Bars.—The market is strong, and we report sales of 5000 to 6000 tons at \$29.50, f.o.b. cars, Pittsburgh.

(By Mail.)

We can deny on official authority the report that the Moore interests have secured control of the Bessemer works of the Ashland Steel Company, together with identified interests of that concern at Ashland and Iron-ton, Ohio. While it seems probable that the Moore interests are breaking away from the United States Steel Corporation, they have not secured control of the plants named above. There is nothing of special importance to note in the Iron trade this week. The market is strong, but prices are no higher. The amount of tonnage coming in, in view of the fact that there is no incentive to buy ahead, is surprisingly large. The mills are filled up with work for two or three months, and it is also true that a large amount of raw and finished material has been sold through first quarter and first half of next year. The car shortage, which has seriously affected the Iron and Steel, Coal and Coke trades for some weeks past, is showing some improvement, but there is still a lack of motive power to haul the immense tonnage that is being offered to the railroads. It is evident that a large number of new engines and cars and new trackage will have to be built to supply the growing needs of the country for railroad facilities. The daily press is full of re-

ports of a \$2,000,000,000 Steel trust, to be headed by Henry C. Frick of this city. It is hardly necessary to deny this senseless rumor, which has no foundation, in fact.

Muck Bar.—The market on Muck Bar seems to be a trifle firmer, probably due to the fact that Forge Iron has advanced about \$1 a ton. We quote Standard grades of Muck Bar at \$29.50, delivered f.o.b. cars Pittsburgh.

Ferromanganese.—We quote 80 per cent. foreign Ferro at \$50 a ton, delivered at buyer's mill. Domestic Ferro is held at about \$52.50 a ton.

Spelter.—We quote prime grades of Spelter at 4.15c. to 4.20c., Pittsburgh.

Rods.—The very high prices being paid for prompt Steel have strengthened Rods, and higher prices are being asked. We quote Bessemer Rods at \$33 to \$33.50, delivered.

Structural Material.—There is a steady stream of small orders coming in to the mills, which aggregate considerable tonnage. The Columbia Bridge Company have taken a good many orders calling for 4000 to 5000 tons or more. The Wabash Railroad bridge, 10,000 tons, and the Farmers' Deposit Building, 3000 tons, have practically been placed with a local mill. The scheme to build "L" roads in this city has been abandoned, and Emil Swenson, chief engineer, has closed up his office. The Structural mills will carry over into next year a very large tonnage, which they were unable to deliver this year. There is no change in prices, and we quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

Merchant Steel.—The mills are full of tonnage and unable to make deliveries on some kinds of material in less than 90 days. The mills of the Crucible Steel Company are crowded with work, and the Cambria Steel Company are away behind on orders. Prices are very firm, and we quote: Tire Steel, best quality, 1.70c.; Toe Calk, 1.80c. to 1.85c.; Hammered Lay Steel, 3.50c.; Open Hearth Spring, 2.50c. to 2.75c.; Steel Bars, 1.50c., base, in carloads, and 1.60c. in small lots; ordinary Plow Slabs up to 6 inches wide, 2.25c.; over 6 inches wide, 2.40c. An effort has been made to revive the Shafting Association, but one of the principal mills refused to come in and the scheme has been given up, the market being still open. For ordinary orders we quote Cold Rolled and Cold Drawn Shafting at 60 per cent. off in carloads and 55 per cent. off in less than carloads, delivered at all points east of the Mississippi River. For very desirable tonnage it is possible our lower price might be shaded. We quote Tool Steel at 6c. and upward, depending on quality.

Plates.—As yet there has been no betterment in demand for Plates, and some of the mills are very badly in need of tonnage. It was hoped by the Plate mills that demand would have picked up before this, but such is not the case. Reports of weakness in prices are denied, and it is claimed established prices are being rigidly held. They are as follows: Tank Plate, ¼-inch thick, up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.80c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3 16 inch in thickness, \$1 extra; gauges Nos. 7 and 8, \$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

Bars.—The situation as regards Iron and Steel is very satisfactory to the mills, tonnage being large and prices being firmly held. In fact, small lots of both Iron and Steel Bars are being sold right along for prompt delivery at 1.60c. to 1.75c., at maker's mill, which is \$2 to \$5 a ton above the regular price. There is a feeling among certain interests that the price of Steel Bars ought to be further advanced, but this will hardly be

done. We quote Steel Bars at 1.50c., base, with \$2 a ton for Open Hearth stock and the usual advances for special shapes. We quote Common Iron Bars at 1.55c. in carload lots, f.o.b. cars, Pittsburgh, but note that for prompt shipment \$2 to \$3 a ton advance is easily obtainable.

Sheets.—The Sheet trade has settled down to a normal condition, and there is no longer the wide range in prices which characterized the market during the strike and for a month or so after it was settled. The supply of both Black and Galvanized Sheets is very much better, and reasonably prompt deliveries are being made by the mills. Jobbers quote in carload lots as follows: Nos. 10, 11 and 12, 2.40c.; Nos. 14 and 15, 2.50c.; Nos. 16 and 17, 2.60c.; Nos. 18 to 21 inclusive, 2.70c.; Nos. 22, 23 and 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c., No. 28, 3.10c.; No. 29, 3.25c.; No. 30, 3.35c. For small lots of a few bundles of Sheets and for prompt shipment No. 27 brings from 3.15c. to 3.25c., and No. 28, 3.25c. to 3.35c. We quote Galvanized Sheets at 70 and 5 off in carloads, maker's mill, and 70 off in small lots.

Skelp.—Higher prices are being quoted for Steel Skelp, due to the very high prices being paid for prompt Billets and their scarcity. We quote Grooved Iron Skelp at 1.80c. to 1.85c. and Sheared at 1.85c. to 1.90c., maker's mill, less 2 per cent. off for cash in 30 days from date of shipment. Higher prices than these are being quoted on Steel Skelp.

Tubular Goods.—Demand for some kinds of Merchant Pipe has slightly fallen off, as it usually does at this season of the year. We note a very heavy demand for Boiler Tubes, the locomotive shops being full of work and buying heavily. There is no longer the very wide range in prices which characterized the Tube market for so long, but prices quoted by the jobbers to the smaller trade show about the usual advances over those charged by the mills to the jobbers. Prices to consumers in carloads are as follows:

Merchant Pipe.		Per cent.	Per cent.
		Black.	Galvd.
½ to 1½ inch and 11 to 12 inch.....		61	48
¾ to 10 inch.....		68½	56
Casing, Random Lengths.			
	S. & S.		I. J.
2 to 3 inch.....	58		53½
3¼ to 4 inch.....	63		59
4¼ to 12½ inch.....	65		61½
Casing, Cut Lengths.			
	S. & S.		I. J.
2 to 3 inch.....	53½		59
3¼ to 4 inch.....	59		55
4¼ to 12½ inch.....	61½		57½
Boiler Tubes.			
		Up to 22 feet.	
Steel.		Per cent.	
1 inch to 1½ inch and 2¼ inch to 5 inch, inclusive....		85½	
2 inch to 2½ inch, inclusive.....		60	
6 inch and larger.....		59	
Iron.			
1 inch to 1½ inch and 2½ inch.....		43½	
1¾ inch to 2¼ inch.....		43	
2¾ inch to 13 inch.....		53	

To the jobbing trade the mills quote slightly lower prices than are given above.

Iron and Steel Scrap.—Prices on Heavy Steel Melting Stock have gone up from \$1 to \$2 a ton in the past few days, owing to the fact that the Bessemer Steel Works all over the country are trying to get out as much tonnage as possible, and to do this are using large quantities of Melting Stock in their converters. We quote Heavy Melting Stock, consisting of Rail, Billet and Bloom Ends, at \$17.50 to \$18 gross ton. There have been some heavy sales within the past week. We quote Old Iron Rails, which are exceedingly scarce, at \$21 to \$22 gross ton, at Valley mill; No. 1 Railroad Wrought Scrap is \$16 to \$16.50 net ton, and Cast Scrap, \$11.50 to \$12 gross ton; Cast Iron Borings, \$7 to \$7.50; Low Phosphorus Melting Stock, \$18 to \$19 gross ton.

Connellsville Coke.—Supply of cars in the Connellsville Coke region last week was somewhat better, but is still short of being enough to haul the Coke that is piled up in the yards ready for shipment. Output of Coke last week was about 220,000 tons, being 5000 larger than the previous week. Of the 21,833 ovens in the Connellsville region, 19,817 are active and 2016 idle. There is a heavy demand for Furnace and Foundry Coke, and prices are very firm. We quote strictly Connellsville Furnace Coke at \$1.85 to \$2 a ton, and 72-hour Foundry at \$2.25 to \$2.50 a ton. Main Line Coke is also bringing

and sizes of Sheets. The same old difficulty to keep stocks complete is complained of, but an improvement in the matter of delivery from the mills is now felt. Jobbers quote for 1/4-inch and heavier 2.10c. to 2.20c.; stove pipe size of Black Sheets, 3.90c. to 4c.; Galvanized Sheets, 65 off.

The Bartlett Steel Company of Joplin, Mo., were organized October 11, 1901, taking over the business of John L. Bartlett. The company's business is that of jobbers in Structural Steel, Bar and Sheet Iron, Tool and Drill Steel, Castings, &c., and their salesmen will cover the territory in Southwestern Missouri, Kansas, Arkansas, Indian Territory, Oklahoma Territory and Texas. The officers are: Eayre O. Bartlett, president; John W. Harris, vice-president; Jerome B. Grigg, treasurer, and John L. Bartlett, secretary.

Birmingham.

BIRMINGHAM, ALA., October 28, 1901.

There was no change in market conditions concerning Iron the past week. Perhaps the healthy condition of affairs was more emphasized. That was all. There was some talk of an advance, but it did not materialize. Prices, though, were very firm and sellers were indifferent about placing product. Trades are much easier made than when prices were materially lower. On his rounds your correspondent dropped into an office just as a buyer called by telephone, "I want some No. 4 Foundry." Seller responded, "Can let you have 1000 tons November and December." "But I want 2000 tons." "Can't supply you," said the seller. "The 1000 tons will exhaust us." "Very well, I will take it. Now what is the price?" The seller responded, "Ten dollars." "Very well," said the buyer, "enter the order." This illustrates the fact that these letters of late have tried to make prominent—viz., that the buyers found more difficulty in supplying their wants than sellers did in obtaining their price. In conversation with a leading official the remark was made, "I am giving currency to the assertion that the output of this district will not be increased this year." He replied, "You are right. We are working on that supposition. You can with perfect safety say also that the Iron situation in this district has never been more satisfactory. There is no trouble to sell all we care to sell, and the time of delivery is gradually being extended further and further into 1902." Quotations are on the basis of \$11 for No. 2 Foundry. At the close of the week some Pipe works came in and took about 8000 tons of No. 4 Foundry. The orders were scattered among the various grades and among the leading interests the volume of sales materially exceeded the output. Shipments are just what the railroads can furnish transportation for. There is still a great cry for cars, and railroad officials, though straining every nerve, have not succeeded in relieving the situation. Nor will they do it until they largely increase their car equipment. It seems an exaggeration to state that 72 per cent. of the transportation handled by the railroads in Alabama is furnished by the mineral belt. But it is a fact. Concerning Steel there is little to say. The output is large and the quality more uniform and the market with outstretched hands is glad to take it. Two additional Open Hearth furnaces will in the near future be added to the productive capacity of the mill and aid in feeding full rations to the Blooming mill.

The Alabama Steel & Wire Mill are running wide open with double shifts and have all they can do.

The past week we had among us the committee appointed by the British Iron Association to investigate the American Iron trade. They had very little to say for publication beyond the expression of appreciation of courtesies received, but in private they expressed in unstinted terms their surprise at the lavish endowment of this district by nature and emphatically declared that the progress so far attained was but the precursor of what was to follow and make this one of the leading centers of the Iron industries of the world. How could we do otherwise than vote that the committee had sound discrimination and ripe judgment?

The Coal situation is very healthy. Price depends on the reputation of the seam, and varies for run of the mine from \$1 to \$1.10 at the mine and unscreened.

Pittsburgh.

HAMILTON BUILDING, October 30, 1901.—(By Telegraph.)

Pig Iron.—The strongest department of the whole Iron trade is Pig Iron, and it is estimated that the entire stocks in the whole country do not represent a ten days' supply. Bessemer Iron is very strong and a good deal is changing hands. The United States Steel Corporation are reported to be figuring on the purchase of a round lot of Bessemer Iron, say 50,000 tons, for December shipment. There is only a fair inquiry for Forge Iron. Foundry Iron is extremely active and there have been heavy sales for deliveries running through the first half of next year. The buying is general and small foundries that usually buy only a few tons at a time are placing orders for 300 to 500 ton lots. It is estimated that from 40,000 to 50,000 tons of Foundry Iron have been sold for delivery in this district in the next six to eight months. Prices have advanced sharply and No. 2 is \$15 minimum, with sales reported as high as \$15.25 to \$15.50. We quote Bessemer Iron at \$15.25, Valley furnace, or \$16, Pittsburgh. It is possible that for prompt Bessemer Iron 10c. to 15c. a ton more might be obtained. We quote Northern Forge Iron from \$14.10 to \$14.25, Pittsburgh. We note a sale of 250 tons at \$14.15. There is not much incentive now for furnaces to make Forge Iron as Foundry is from 75c. to \$1 a ton higher and costs no more to make than mill. We quote No. 2 Foundry Iron at \$15 to \$15.50 and No. 1 at \$15.50 to \$16, Pittsburgh.

Steel.—An item of much interest in the Steel market is that a local concern have just imported a round lot of Basic Bessemer Billets from Germany and for shipment west of Pittsburgh. Conditions attached to this transaction were very favorable, prices of Steel in Germany being low and favorable ocean freights having been obtained. The transaction was very satisfactory to both buyers and seller, and as a result further negotiations are on for the importation from Germany of a round lot of Sheet Bars, and which will likely be put through. High premiums continue to be paid for prompt Steel, and we quote ordinary 4 x 4 Bessemer Billets at \$27 to \$27.50, Pittsburgh. Above \$28 has been obtained for small lots of Billets for prompt shipment and of undesirable sizes to roll. Contracts for Billets for delivery in first quarter and first half of next year could probably be placed at \$24 to \$24.50, maker's mill. Sheet Bars are held at about \$28, maker's mill, but shipments on old contracts are being made at lower prices.

Rails.—Amount of tonnage booked in Rails for next year is greatly exaggerated in the daily press. It is probable that with old and new orders the Rail mills have about 1,200,000 tons booked on which to enter the new year. This will give steady work to the mills for six months. A prominent official of a Rail concern denies that the price will be advanced to \$30. We quote at \$28, at mill.

Muck Bars.—The market is strong, and we report sales of 5000 to 6000 tons at \$29.50, f.o.b. cars, Pittsburgh.

(By Mail.)

We can deny on official authority the report that the Moore interests have secured control of the Bessemer works of the Ashland Steel Company, together with identified interests of that concern at Ashland and Iron-ton, Ohio. While it seems probable that the Moore interests are breaking away from the United States Steel Corporation, they have not secured control of the plants named above. There is nothing of special importance to note in the Iron trade this week. The market is strong, but prices are no higher. The amount of tonnage coming in, in view of the fact that there is no incentive to buy ahead, is surprisingly large. The mills are filled up with work for two or three months, and it is also true that a large amount of raw and finished material has been sold through first quarter and first half of next year. The car shortage, which has seriously affected the Iron and Steel, Coal and Coke trades for some weeks past, is showing some improvement, but there is still a lack of motive power to haul the immense tonnage that is being offered to the railroads. It is evident that a large number of new engines and cars and new trackage will have to be built to supply the growing needs of the country for railroad facilities. The daily press is full of re-

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Ferromanganese.—We quote 80 per cent. foreign Ferro at \$50 a ton, delivered at buyer's mill. Domestic Ferro is held at about \$52.50 a ton.

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Structural Material.—There is a steady stream of small orders coming in to the mills, which aggregate considerable tonnage. The Columbia Bridge Company have taken a good many orders calling for 4000 to 5000 tons or more. The Wabash Railroad bridge, 10,000 tons, and the Farmers' Deposit Building, 3000 tons, have practically been placed with a local mill. The scheme to build "L" roads in this city has been abandoned, and Emil Swenson, chief engineer, has closed up his office. The Structural mills will carry over into next year a very large tonnage, which they were unable to deliver this year. There is no change in prices, and we quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

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Bars.—The situation as regards Iron and Steel is very satisfactory to the mills, tonnage being large and prices being firmly held. In fact, small lots of both Iron and Steel Bars are being sold right along for prompt delivery at 1.60c. to 1.75c., at maker's mill, which is \$2 to \$5 a ton above the regular price. There is a feeling among certain interests that the price of Steel Bars ought to be further advanced, but this will hardly be

done. We quote Steel Bars at 1.50c., base, with \$2 a ton for Open Hearth stock and the usual advances for special shapes. We quote Common Iron Bars at 1.55c. in carload lots, f.o.b. cars, Pittsburgh, but note that for prompt shipment \$2 to \$3 a ton advance is easily obtainable.

Sheets.—The Sheet trade has settled down to a normal condition, and there is no longer the wide range in prices which characterized the market during the strike and for a month or so after it was settled. The supply of both Black and Galvanized Sheets is very much better, and reasonably prompt deliveries are being made by the mills. Jobbers quote in carload lots as follows: Nos. 10, 11 and 12, 2.40c.; Nos. 14 and 15, 2.50c.; Nos. 16 and 17, 2.60c.; Nos. 18 to 21 inclusive, 2.70c.; Nos. 22, 23 and 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c., No. 28, 3.10c.; No. 29, 3.25c.; No. 30, 3.35c. For small lots of a few bundles of Sheets and for prompt shipment No. 27 brings from 3.15c. to 3.25c., and No. 28, 3.25c. to 3.35c. We quote Galvanized Sheets at 70 and 5 off in carloads, maker's mill, and 70 off in small lots.

Skelp.—Higher prices are being quoted for Steel Skelp, due to the very high prices being paid for prompt Billets and their scarcity. We quote Grooved Iron Skelp at 1.80c. to 1.85c. and Sheared at 1.85c. to 1.90c., maker's mill, less 2 per cent. off for cash in 30 days from date of shipment. Higher prices than these are being quoted on Steel Skelp.

Tubular Goods.—Demand for some kinds of Merchant Pipe has slightly fallen off, as it usually does at this season of the year. We note a very heavy demand for Boiler Tubes, the locomotive shops being full of work and buying heavily. There is no longer the very wide range in prices which characterized the Tube market for so long, but prices quoted by the jobbers to the smaller trade show about the usual advances over those charged by the mills to the jobbers. Prices to consumers in carloads are as follows:

Merchant Pipe.		Per cent.	Per cent.
		Black.	Galvd.
½ to 1½ inch and 11 to 12 inch.....	61	48	
¾ to 10 inch.....	68½	56	
Casing, Random Lengths.		S. & S.	I. J.
2 to 3 inch.....	58	53½	
3¼ to 4 inch.....	63	59	
4¼ to 12½ inch.....	65	61½	
Casing, Cut Lengths.		S. & S.	I. J.
2 to 3 inch.....	53½	59	
3¼ to 4 inch.....	59	55	
4¼ to 12½ inch.....	61½	57½	
Boiler Tubes.		Up to 22 feet.	Per cent.
Steel.			
1 inch to 1¾ inch and 2¾ inch to 5 inch, inclusive....	65½		
2 inch to 2½ inch, inclusive.....	60		
6 inch and larger.....	59		
Iron.			
1 inch to 1½ inch and 2½ inch.....	43½		
1½ inch to 2¼ inch.....	43		
2¾ inch to 13 inch.....	53		

To the jobbing trade the mills quote slightly lower prices than are given above.

Iron and Steel Scrap.—Prices on Heavy Steel Melting Stock have gone up from \$1 to \$2 a ton in the past few days, owing to the fact that the Bessemer Steel Works all over the country are trying to get out as much tonnage as possible, and to do this are using large quantities of Melting Stock in their converters. We quote Heavy Melting Stock, consisting of Rail, Billet and Bloom Ends, at \$17.50 to \$18 gross ton. There have been some heavy sales within the past week. We quote Old Iron Rails, which are exceedingly scarce, at \$21 to \$22 gross ton, at Valley mill; No. 1 Railroad Wrought Scrap is \$16 to \$16.50 net ton, and Cast Scrap, \$11.50 to \$12 gross ton; Cast Iron Borings, \$7 to \$7.50; Low Phosphorus Melting Stock, \$18 to \$19 gross ton.

Connellsville Coke.—Supply of cars in the Connellsville Coke region last week was somewhat better, but is still short of being enough to haul the Coke that is piled up in the yards ready for shipment. Output of Coke last week was about 220,000 tons, being 5000 larger than the previous week. Of the 21,833 ovens in the Connellsville region, 19,817 are active and 2016 idle. There is a heavy demand for Furnace and Foundry Coke, and prices are very firm. We quote strictly Connellsville Furnace Coke at \$1.85 to \$2 a ton, and 72-hour Foundry at \$2.25 to \$2.50 a ton. Main Line Coke is also bringing

better prices, and we quote Standard makes of Furnace at \$1.65 to \$1.75, and Foundry at \$1.85 to \$2 a ton at oven.

New York.

NEW YORK, October 30, 1901.

Pig Iron.—The market is steady, but without any special activity. The Pipe industry has taken additional quantities lately. We quote: Lehigh, Schuylkill and Virginia Irons, No. 1, \$16 to \$17.50; No. 2 X, \$15 to \$15.75; No. 2 Plain, \$14.25 to \$14.50; Gray Forge, \$14 to \$14.50; Tennessee and Alabama brands, No. 1 Foundry, \$15.50 to \$15.75; No. 2 Foundry, \$14.75 to \$15; No. 1 Soft, \$15.50 to \$15.75; No. 2 Soft, \$14.75 to \$15; No. 3 Foundry, \$13.75 to \$14; No. 4 Foundry, \$13.50 to \$13.75; Gray Forge, \$13.25 to \$13.50.

Cast Iron Pipe.—The demand keeps up astonishingly well, favored by the good weather for outdoor work. Usually at this time of the year the makers begin to lay out their plans for making stock Pipe during the winter for the spring demand. They will not be able to give it any consideration for some time to come. The New York Department of Water Supply is in the market for 8650 tons of Pipe, for which bids are to go in on November 7, and Boston is to come up later on for an even larger quantity. It is exceptionally early for municipalities to take up the question of the supply. We note a sale of about 600 net tons of Pipe to Cleveland by an Eastern shop. We quote Cast Iron Pipe, tidewater delivery, \$26 to \$27 per gross ton.

Steel Rails.—Rumors of an early advance in the price of Steel Rails are numerous, but are not taken seriously by the trade. A number of contracts have been placed by Eastern roads. We continue to quote \$28 at Eastern mill for Standard Sections.

Finished Iron and Steel.—The Brooklyn Elevated Works, involving about 6000 tons of material, has not yet been finally placed. The demand for manufacturing buildings continues very active, and in the aggregate a very large business has been placed. We quote as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.80c. to 1.85c. for Tank, 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange, and 3.25c. for Fire Box. Refined Bars are 1.60c. to 1.65c.; Soft Steel Bars, 1.62½c. to 1.65c.

Metal Market.

NEW YORK, October 30, 1901.

Pig Tin.—Conditions remain practically unchanged from last week. Business is quiet, the demand for spot being particularly slack. Prices have not changed much during the week, and, in short, the market has possessed little of interest. There were 25 tons of Tin shipped from this market to Genoa during the week. This transaction was made possible by the fact that our market for spot Tin is slightly below London's spot figure, and that freight rates from here to Europe are extremely low at this time. Closing prices to-day were as follows: Spot and October, 24.85c. to 25c.; November, 24.70c. to 24.75c.; December, 24.12½c. to 24.15c.; January, 23.65c. to 23.85c.; February, 23.62½c. sellers. London closed £114 for spot and £107 15s. futures, a slight advance on last week's figures.

Copper.—Sensational rumors continue to circulate with a rapidity equalled only by the promptness of the denials as to their truth. In the meantime consumers show an increased disposition to postpone all but the most necessary purchases. Such purchases at this time are of very small volume. This is especially the case as regards Lake. The rumors emanate from the Wall street district and are circulated to effect the fluctuations of the Copper stocks. When the tape shows a decline it is immediately reported that the price of Copper is to be cut to 11 or 12 cents. When there is a recovery in the prices of Copper stocks the unusually interesting announcement is made that the Amalgamated interests have acquired control of the Calumet & Hecla Company. That a reduction of the price of Copper will be made is

firmly believed by the trade, but it is not looked for just yet. The reports of the acquisition of control of the Calumet & Hecla properties are simply the occasion of amusement in the trade. That stability should be given to the market by any formal agreement between the Amalgamated and outside interests is not generally believed. The Amalgamated Company have been holding the umbrella over the heads of the outside companies for a long while and can only take it down by cutting prices. In Lake Copper business is practically at a standstill. The production for the balance of this year is practically all contracted for, and what is changing hands now is only for retail account. In Electrolytic the outside companies continue to sell at ¼c. to ½c. below the prices asked by the United Metals Selling Company, but demand for this brand is limited to the immediate wants of consumers. Prices are unchanged. Lake is held at 16.85c. to 17c. Electrolytic is quoted from 16.30c. to 16½c., and Casting stock varies in price from 15½c. to 16.30c., according to brand. Owing to the fact that Chile Bars are about entirely withdrawn for refining purposes sellers of spot in London must deliver a better grade of goods. Consequently the price of spot is much higher than that for futures. Another reason given for the wide discount on futures is that confidence in the future of the article is entirely lacking. The London market closed to-day £64 17s. 6d. for spot and £63 12s. 6d. for futures. Best Selected advanced to £72.

Pig Lead.—There is no change in the situation. Business is dull and prices unchanged. The American Smelting & Refining Company quote 4.37½c. for Desilverized, f.o.b. New York, and 4.32½c., St. Louis. London has declined a shade, coming £11 8s. 9d.

Spelter.—Spot here is scarce and held at about 4½c. Shipments from the West are, however, offered at 4¼c., without finding buyers. December delivery was offered at 4.25c. The St. Louis market is easy at 4.10c. London has declined 2s. 6d. to £16 15s. The European Convention of Producers, which was expected to regulate production and prices abroad, failed to do so, as the Silesian producers refused to join in the movement.

Antimony.—Has declined a shade. Hallett's is now quoted 8¾c. Cookson's is unchanged, being held nominally at 10¼c. Outside brands declined to 8c. to 8¼c.

Nickel.—Is unchanged, prices continuing on a basis of 60c. for lots not covered by yearly contracts.

Quicksilver.—There is no change. The price is \$5 per per flask, of 76½ lbs. in lots of 50 flasks and more.

Tin Plates.—With the exception of a slight decline in London the situation is unchanged. The American Tin Plate Company are selling only for the first quarter of next year on a basis of \$4.19 per box of standard 100-lb. Cokes, f.o.b. New York, and \$4, f.o.b. mills. The London price declined 4½ pence to 13 shillings 9 pence.

Shenango Furnace Company.—The Shenango Furnace Company, W. P. Snyder, president, with offices in the German National Bank, in Pittsburgh, and operating two blast furnaces at Sharpville, Pa., have just purchased the Spearman blast furnace of the Spearman Iron Company, at Sharpville, Pa. The stack is 76 x 17, was built in 1895 and blown in on September 1, 1895. The stack was originally equipped with four Whitwell stoves, 60 x 16 feet, but last year the furnace was rebuilt, the stoves enlarged to 80 x 20 feet and the shell was raised. Heavier engines were also installed and the furnace was completely remodeled and rebuilt, bringing the capacity up to 300 tons a day. This stack, in connection with the other two stacks, will give the Shenango Furnace Company a daily capacity for turning out about 700 tons of metal. Some remarkable records have recently been made in the smaller Shenango Furnace, which is only 60 feet high and 14 feet in diameter at the bosh. This furnace, for the past seven weeks has made a daily average of 210 tons of standard Bessemer iron, and on one day the output got up to 231 tons. The iron was extremely low in silicon and phosphorus. These records, for such a small furnace, are all the more remarkable from the fact that 90 per cent. Mesabi ore is being used, and certainly speaks well for the management of the furnace.

The New York Machinery Market.

NEW YORK, October 30, 1901.

In all quarters of the trade business during the week has been of good volume. Orders have not been as numerous as they were last spring, but that has been the case for some months past. There is, however, a perceptible increase in the volume of business transacted as compared with the last few weeks. This is through a steady, gradual growth rather than on account of any especially large individual contracts.

Machinery merchants are confident of a continuance of sound business conditions. The class of business that is consummated nowadays is of a more staple and solid class than that which characterizes boom times. There is no wildcat buying on extended credit. Financial backers of new projects have evidently learned the difference between the good and those predestined to go down as unsuccessful. The machinery that is being sold to-day goes into good hands, and this class of purchasers are showing a disposition to take a liberal view of future prospects.

Prices are strong for all classes of machinery, with the possible exception of the smaller sizes of engines, where competition is very keen, and shading is indulged in by some builders to capture business.

Machine Tools.

This is a section of the trade which has enjoyed an especially active demand during the last week. Orders were numerous, while not especially large. An excellent line of inquiries was received. One prominent Liberty street machine tool merchant stated that this closing week of the month will bring the total of this month's business to a higher figure than any month since he has been in business. Demand for spot delivery of tools was large. As a result the stocks of merchants both in their stores and warehouses were considerably drawn on. Bare spots on the floors of machinery warerooms attest this fact. A well-known purchaser in this district has been trying to obtain immediate delivery on a certain size of lathe. At last report he has been unable to secure the desired machine, although he has been in telephonic communication with all of the large Liberty street houses. There is every indication that a good, steady stream of business is going into machine tool factories, continually putting deliveries further off.

A fair sized list is being bid on which was issued by the American Axe & Tool Company of 253 Broadway, New York. Purchases have not been made as yet.

The International Power Company of Providence, R. I., are buying a fair sized lot of tools to be used in the production of the Diesel oil engine, which is to be built by the International Company.

The Hygeia Water Company of 349 West Twelfth street, New York, have been shopping about for a number of tools to be installed in a new shop, which the company contemplate building.

The International Pump Company of 26 Broadway, New York, are buying a special lot of tools for installation in the Laidlaw-Dunn-Gordon plant, at Cincinnati, where extensive improvements are being made. R. D. Nuttall & Co. of Pittsburgh, and the Union Switch & Signal Company, are both ordering machinery for extending their plants.

The Winchester Arms Company of Hartford, Conn., are extending their shops, and are purchasing extensively.

This is also the case with the Lewis Foundry & Machine Company of Pittsburgh.

In a previous issue mention was made of operations looking toward the absorption of the Acme Machine Screw Company of Hartford, Conn., by the National-Acme Mfg. Company of Cleveland, Ohio. At that time the matter had not been officially announced. We are now in receipt of official notification setting forth the exact facts of the transaction.

The Acme Machine Screw Company of Hartford and the National Mfg. Company of Cleveland, Ohio, have been absorbed by the National-Acme Mfg. Company, recently incorporated under the laws of Ohio, with a capi-

tal of \$750,000. The valuable manufacturing site in Cleveland formerly operated by the National Mfg. Company has been acquired by the new company, and contracts have been let for the erection of a large modern factory of brick and steel, 300 x 50 feet, and four stories high, to be operated in conjunction with the present Cleveland plant. As soon as the new works are ready for operation the Hartford plant will be abandoned. The officers of the new company are president, W. D. Alexander, formerly president of the National Mfg. Company; vice-president, D. Elliot, formerly vice-president of the National Mfg. Company; treasurer, O. S. Wentz, formerly secretary of the National Mfg. Company; secretary, A. W. Henn, formerly president of the Acme Machine Screw Company, and general superintendent, E. C. Henn, formerly general superintendent of the Acme Machine Screw Company.

The Sturgess Governor Engineering Company, manufacturers of governors for turbines and impulse water wheels of West Troy, N. Y., are buying a considerable quantity of machinery. The company write us as follows: "The first installment consists of a machine shop, 100 x 50 feet, which we are equipping with the most modern machine tools for the purpose of assembling and testing our governors. The equipment consists of boring mills, milling machines, lathes and other similar tools common to a machine shop of this description. We expect to shortly duplicate this machine shop, and may also add a foundry and other shops, as we are laying ourselves out for doing our work in the most thorough manner possible. We have already purchased most of our first equipment, but have yet orders to place for some of the smaller material." John Sturgess is vice-president and general manager of the company.

We are advised that all of the machinery of the American Arms Company of Boston, Mass., manufacturers of shot guns and revolvers, under the management of the late Geo. H. Fox, has been purchased by the Marlin Arms Company, and is being moved to New Haven, Conn., to be added to the Marlin plant in that city.

Boilers and Engines.

It is reported that there are several very large projects in embryotic stages that will probably be favorably decided upon in the near future. Two of these plants, it is said, will each involve the outlay of about \$2,000,000. Whether they are electric lighting or traction schemes cannot be learned as yet. Prominent engineers have the matters in charge. We are also informed that a well-known engineer has been engaged to prepare plans for a general rearrangement of the traction systems of Boston. This work, if carried out, will involve a large expenditure for new equipment.

Engineers are preparing plans for an extensive trolley system to be built in upper New York State. The preliminary stages of this work, we understand, are pretty well advanced, and the project will soon be announced officially.

The most important item of interest in this line announced during the week was to the effect that Westinghouse, Church, Kerr & Co. of 26 Cortlandt street have been engaged by the Pennsylvania Railroad to design and equip another 1000 horse-power boiler house at Altoona, Pa. A similar plant has just been completed at Altoona by this company, and the new station will practically be a duplicate. Bids for the equipment of the station are being received by Westinghouse, Church, Kerr & Co. The specifications call for water tube boilers, feed water heaters and all accessories. Roney stokers will be employed. It is interesting to note in this connection that the Pennsylvania Company, with their great engineering forces, should retain an engineering concern to design and equip a power station. It is simply an illustration of the success of specializing in engineering.

Westinghouse, Church, Kerr & Co. have secured a number of good orders for 125 horse-power gas engines. Engines of this type and size will be supplied to Tide-water Pipe Company, New York; Mannington Electric Light Company of Mannington, W. Va.; Winchester Arms Company of Hartford, Conn.; R. D. Nuttall & Co.

of Pittsburgh; Lewis Foundry & Machine Company of Pittsburgh, and the Union Switch & Signal Company of Pittsburgh.

The International Steam Pump Company of 26 Broadway, New York, are in the market for a 250 horse-power plant. The apparatus is to be installed in the Laidlaw, Dunn, Gordon plant at Cincinnati. Mr. Rogers, superintendent of the Worthington plant at Brooklyn, is in charge of the matter.

We are informed that the Hartford Carpet Corporation of Hartford, Conn., and Thompsonville, Conn., will soon be in the market for a power plant of several thousand horse-power. It is intended to erect a large new plant, plans for which are now being prepared. Mr. Higgins, at the factory at Thompsonville, is in charge of the matter.

Miscellaneous.

The Leather Belting Manufacturing Association has called a special meeting to be held on November 12 to adopt some action in regard to the recent large advance in belting prices. The meeting will be held at the Astor House, New York, and the business of the usual annual meeting, which will be dispensed with this year, will at the same time be transacted. Members of the association from various parts of the country will attend this meeting, as the matters to be discussed are of great importance to leather manufacturers.

The Ruggles-Cole Engineering Company of 39-41 Cortlandt street are designing a new cement mill to be erected at Marksboro, N. J., for the Marksboro Portland Cement Company. The former concern will purchase the equipment. Specifications for the machinery will be ready within about two weeks. C. J. Curtin, the manager of the Marksboro Company, has offices at 80 William street.

The Riter-Conley Mfg. Company, whose New York offices are located at 39-41 Cortlandt street, have received an order for the largest steel water tank ever built. It will have a capacity of 1,000,000 gallons, and will be erected on a stand 135 feet high. From the ground to the top of the tank the distance will be 260 feet. The tank is to be erected in Providence, R. I., by the East Providence Water Company.

Purchases are now being made by the De Lamar Copper Refining Works of Carteret, N. J. As previously stated in this column, this is a new enterprise about to build a plant at Carteret. H. A. Prosser is the manager of the company, and has associated with him W. E. Tobey, consulting engineer, formerly of 60 Liberty street, New York. The power plant is to be of 1000 horse-power capacity. The engine order went to the Harrisburg Foundry & Machine Company. The boilers will be equipped with Roney stokers.

We are officially advised that the A. B. See Electric Elevator Company, whose principal offices are located at 220 Broadway, are negotiating for a site in New Jersey for the erection of a new plant. The works occupied at present by the company are located in Brooklyn on the site of the proposed terminal of the new East River bridge. As soon as it became apparent that these works would have to be vacated, a new site was purchased in Brooklyn. Mr. See, realizing that the new location would not permit of future expansion, decided to dispose of it and look for quarters in New Jersey, where sufficient ground could be obtained to allow for future growth, and where it would not be necessary to have the works a great distance from the New York office. While the exact location has not as yet been decided upon, it is probable that the new works will be built at either Newark or Jersey City, or in the immediate neighborhood of these cities. The plant will be designed on modern principles and an up to date equipment of labor saving machinery will be installed. The machinery will be electrically operated.

The Armstrong Bros. Tool Company of Chicago have just received an order for Armstrong tool holders from the Mexican Central Railway Company, Limited, which is a strong indication of the increasing interest in tools of this class among railway shops. After placing several small orders for tool holders of various kinds, with which they have had more than one year's experience, the Mexican Central Railway Company have sent their

order for over 200 Armstrong tool holders, mostly of heavy sizes.

Schischkar & Co. of Birmingham, England, have purchased from the Acme Machine Screw Company of Hartford, Conn., their patents on their automatic screw machines which were granted for the United Kingdom of Great Britain and Ireland. These patents Schischkar & Co. have disposed of to P. F. Pease & Co. of Darlington, London and Worcester, England. The purchase price was \$40,000. It is the intention of Pease & Co. to manufacture all sizes of these machines for the English market, also to lay down a large plant for the output of parts. Pease & Co. have the most extensive factory at Worcester and buildings of large capacity ready for the reception of machinery for the manufacture of these machines. Schischkar & Co., who are the sole European agents for the Acme Machine Screw Company, have sold 50 of these machines in Great Britain in ten months.

An Interesting Boiler Decision.

The Name "Babcock & Wilcox."

A decree has been entered in the United States Circuit Court for the Northern District of California in the case of the Babcock & Wilcox Company vs. the Joshua Hendy Machine Works. The decision of Judge Morrow reads:

Ordered, adjudged and decreed as follows, to wit:

1. That complainant, the Babcock & Wilcox Company and its predecessor, the firm Babcock & Wilcox, are conducting and have conducted a business in the manufacture and sale of steam apparatus, including boilers, which was established many years prior to 1880 and has continued ever since: that by reason of the care, experience and excellence of workmanship, materials, methods and tools always employed in said business the steam apparatus produced and sold therein has been of first-class quality, durability, efficiency and safety, and has acquired all over the world an exceedingly high and valuable reputation under the name "Babcock & Wilcox."

2. That the name "Babcock & Wilcox" was originated and adopted exclusively as the trade name of said business and has been continuously so used from the commencement to the present time; that the said trade name "Babcock & Wilcox" identifies exclusively the steam apparatus manufactured by the complainant and the quality, durability, efficiency and safety of the same, due to the care, experience, workmanship, materials, methods and tools employed by the complainant, and distinguishes it from all apparatus, of whatsoever form or character, made by other manufacturers; that said trade name "Babcock & Wilcox" cannot be truly or lawfully used on or in relation to any apparatus of any form or character whatsoever manufactured by any other person, firm or corporation than the complainant.

3. That the complainant is the sole and exclusive owner of said trade name, "Babcock & Wilcox," whether alone or in connection with other word or words, and is entitled to have it used exclusively on and in relation to steam apparatus of its own manufacture.

4. That the respondent herein has infringed upon said trade name, "Babcock & Wilcox," and upon the exclusive rights of the complainant therein and thereunder, by offering for sale under the name "Standard Babcock & Wilcox" boilers which were not manufactured by the complainant, but on the contrary were manufactured by the Standard Safety Boiler Company, or others.

5. That a perpetual injunction be and it is hereby issued against the respondent, the Joshua Hendy Machine Works, and its officers, agents, attorneys, servants, clerks and employees, enjoining it and them and each of them from using the name "Babcock & Wilcox," either alone or combined with other word or words, upon or in connection with the sale or offering for sale of any boiler or other steam apparatus not manufactured by the complainant and from stating or representing that any boiler or other steam apparatus sold or dealt in by the respondent and not manufactured by complainant is a Babcock & Wilcox boiler, and from selling or offering for sale or passing off any such boiler or other steam apparatus as and for boilers or steam apparatus manufactured and sold by complainant.

PERSONAL.

George F. Brown has been appointed general manager of the manufacturing department of the Pullman Company.

Lucius B. Sherman has been appointed Western manager of the *Railroad Gazette*, with headquarters at the Monadnock, Chicago.

W. A. Sweet has retired from the active management of the Sweet Steel Company of Syracuse, N. Y., although still holding a controlling interest in the concern. The sales department will be conducted by H. L. Stevens and the manufacturing and engineering departments by J. W. Maxwell.

J. H. Snyder has been elected superintendent and manager of the National Machinery Company, Tiffin, Ohio, in succession to Frank Bloom, resigned.

Edward Renshaw, formerly of Lebanon, Pa., who of late years has been operating an iron plant in Montreal, Canada, has returned to Lebanon as superintendent of the American Iron & Steel Company's works at that place.

The presentation took place last week, with appropriate ceremonies, of the Rebecca Mickley Thomas Memorial Pavilion at St. Luke's Hospital, South Bethlehem. It is an operating pavilion, the gift of Samuel Thomas of Catasauqua, Pa.

On Friday, October 25, Charles M. Schwab, president of the United States Steel Corporation, arrived in Pittsburgh, and on Saturday afternoon in the Board room of the Carnegie Steel Company Mr. Schwab was presented with a superb silver loving cup by the heads of the operating departments in the constituent companies of the Carnegie Steel Company. The presentation speech was made by W. E. Corey, president of the Carnegie Steel Company, and was feelingly responded to by Mr. Schwab. The cup stands 14½ inches from the base, which is wrought in the same metal, and stands on three legs. The ornamentation is elaborate and artistic. The inscription reads: "From the operating officials of the Carnegie Steel Company to Charles M. Schwab as a token of their affection and regard, April 1, 1901."

Daniel McLaren, who has been the manager of the Addyston branch of the United States Pipe & Foundry Company and who was formerly president of the Addyston Pipe & Steel Company of Addyston, Ala., has resigned in order to accept an important position with one of the Northwestern railroads.

Garry B. Levan has been appointed superintendent of Laura Furnace, of the Republic Iron & Steel Company, at Youngstown, Ohio.

D. G. Reid has resigned as president of the American Tin Plate Company, and Warner Arms as second vice-president. Mr. Reid gives up the active conduct of the affairs of the company in order to devote his entire time to the duties of his position as a member of the Executive Committee of the United States Steel Corporation, and Mr. Arms to gratify a long expressed desire to rest from the exacting duties of active business after more than 30 years' continuous service. The vacancies occasioned by these changes have been filled by the election of the following named gentlemen: W. T. Graham, president; W. M. Leeds, first vice-president; Frank Dickerson, second vice-president. In connection with the office of second vice-president, Frank Dickerson will still retain his position as general sales agent of the company.

Stuart Uttley, secretary of the Trades Council of Sheffield, is in this country studying the labor situation.

Ernest W. Saunders, who for a number of years has been identified with the sales department of the Pratt & Whitney Company, has severed his connection with that firm and has made connections with H. A. Rogers of 19 John street. In addition to supplying the trade with machinists', engineers' and mill supplies, Mr. Saunders will also attend to inquiries for machine tools.

Andrew Welsh, master mechanic at the Bessemer steel plant of the Republic Iron & Steel Company, Youngstown, Ohio, has resigned. William G. Backus, chief engineer of the same plant, has also resigned.

James P. Kennedy, district manager of the American Bridge Company, at Youngstown, Ohio, is seriously ill of typhoid fever and may not recover.

Iron and Industrial Stocks.

During the week the stock market, so far as it relates to iron industrials, has been quiet and values have generally receded somewhat. While the U. S. common has fairly held its own, the preferred has shown a larger decline. Rumors that the underwriting syndicate has practically completed its work are current. There has been a revival of the reports of a coming absorption of the Colorado Company, but they are denied. There has been a good deal of discussion of the relations between the American Tin Plate Company and the American Can Company. The latter is represented as growing restive over the power of the former in the matter of a supply of raw material, and as working toward the acquisition of a steel plant and of sheet mills, utilizing the Norton rolling patents. The Cambria stock has been affected by an interview credited to Effingham B. Morris, which indicates a very conservative dividend policy.

The Pressed Steel Car Company have issued the following statement of earnings for the third quarter of the present fiscal year ended September 30, which compares as follows with the first two quarters of the present fiscal year:

	Net earnings.	Preferred dividend and depreciation charges.	Net surplus.
Third quarter.....	\$511,918	\$230,098	\$281,820
Second quarter.....	642,369	290,780	351,589
First quarter.....	439,330	306,603	132,727
Nine months.....	\$1,593,617	\$827,481	\$766,136

On the Pittsburgh Stock Exchange last week 113½ and interest was bid on \$100,000 worth of bonds of the United States Steel Corporation. These bonds are subject to call at 115 at the option of the corporation after 1910.

Stock of the Pittsburgh Reduction Company, makers of aluminum, was quoted 182 on the Pittsburgh Stock Exchange last week. A material advance in the stock of this concern has taken place, due to a court decision favorable to the company.

Dividends.—The Shelby Iron Company have declared a semiannual dividend of 5 per cent. and an extra dividend of 2 per cent., payable November 15. Books close November 5 and reopen November 16.

The Westinghouse Electric & Mfg. Company have declared the regular quarterly dividend of 1¼ per cent. on their assenting stock, payable November 15. Books close November 2 and reopen November 16.

The Pressed Steel Car Company have declared the regular quarterly dividends of 1¼ per cent. on the preferred stock and 1 per cent. on the common stock. The preferred dividend is payable November 21. Books close October 31 and reopen November 21. The common stock dividend is payable November 28. Books close November 7 and reopen November 28.

Francis T. F. Lovejoy, former secretary of the Carnegie Steel Company, has embarked in the manufacture of automobiles. In connection with George A. Banker and Arthur L. Banker he has applied to the secretary of the Commonwealth of Pennsylvania for a charter for a corporation to be called Banker Brothers' Company, to manufacture, sell and deal in automobiles. The new company have a nominal capital of \$50,000. A plant is in course of erection on Baum street, Pittsburgh. A special line on the order of the new vehicle built especially for H. C. Frick in Europe, having 40 horse-power, will be put on the market. The new concern will also hire automobiles at so much per hour.

The Pittsburgh Steel Foundry, whose works are at Glassport, Pa., are turning out some very large castings for the Talbot open hearth furnace, being built by Jones & Laughlins, Limited, in their American Iron & Steel Works, on the South Side, Pittsburgh.

The Cleveland Machinery Market.

CLEVELAND, OHIO, October 28.

Every one connected with the machinery or, allied trades in this city reports a very satisfactory condition of affairs. The indications for continued prosperity grow brighter each week, and it is believed by many that this winter will show a heavier volume of trade than either 1899 or 1900. Manufacturers and dealers in machine tools say that the present demand comes largely from those who are making small additions to their equipments rather than large increases; orders are for a machine or two at a time rather than for large lots; but the aggregate is very satisfactory. It is thought, however, that in the near future there will be a marked increase in the size of orders, as it is said that in this section at least a number of new factories and extensions are going up which will mean heavy purchases within the next month or two in order that equipments may be ready to commence operations early in the spring, when buildings under way are completed. In fact, there has not been a time in many months when so many deals were about to be closed. There are a number of excellent openings for manufacturers of engines, boilers and electrical equipments, as well as for iron and wood working tools, as will be seen from the details which follow.

Never before in the history of shipbuilding on the great lakes has there been such a boom in the business. Every berth at the different yards of the American Shipbuilding Company has been taken for some time, and at least a dozen of the vessels that are under contract will not come out until next summer. Within the past ten days the American Shipbuilding Company have closed contracts for four large vessels. The Franklin Transportation Company, just organized with a capital stock of \$300,000, and with D. R. Hanna as president, have placed an order for two vessels with a carrying capacity of 10,000 tons a trip; one a steamer and the other a barge. The steamer will be 356 feet keel and 50 feet beam, and the barge 366 feet keel and 40 feet beam. The former will be built at Detroit, and the latter at Buffalo. They will be managed by M. A. Hanna & Co. The Western Transit Company, Buffalo, have ordered a package freight steamer to cost \$275,000, to be a duplicate of the steamer "Chicago," which was launched at Buffalo last week. The Hawgoods of Cleveland, who have several vessels under construction, have closed another contract for a 6000-ton steamer to cost \$260,000. She will be built at Lorain, and will have triple expansion engines and Scotch boilers. It is stated that other parties are figuring on vessels, and that contracts will be closed in the near future.

The Baker Motor Vehicle Company, manufacturers of electric vehicles, have met with pronounced success in introducing their goods, and will start work as soon as possible on a large six-story building, 140 x 40 feet, which will enable them to increase their output several times. They will shortly place contracts for machinery and power equipment, which will be of the electric drive type.

The Vulcanus Forging Company have recently closed contracts for three self feed 1½-inch rivet machines made by the American Machinery Company of Wilmoughby, a large Cincinnati milling machine company's miller, and other tools. They will shortly place contracts for a Corliss engine, boilers, and a generator for lighting purposes. They are at work on a very large order for bolts for the New York Telephone Company, and a contract for a local concern for dredge forgings sufficient to keep their largest hammers busy for the next two weeks.

Foot, Burt & Co., manufacturers of multiple drills, say there has been a marked improvement in business during the past 30 days, and that October promises to be better than any month this year. They have shipped a number of their largest sized tools this month, and they say that they are receiving some excellent orders from railway shops and builders of automobiles. They have given up for the time being plans for the erection

of a new plant, as they are too busy to give the matter attention.

The Garry Iron & Steel Company are notifying the trade that they are now prepared to take care of all demands for sheet metal work, roofing, eave troughs and structural work. They have taken contracts from the Kilby Mfg. Company for structural work, roofing, &c., for two large sugar houses at Mt. Clemens, Mich., and Wallaceburg, Ontario. Their crane department is very busy at this time. They are shipping a large revolving platform crane to the Michigan Central Railway.

The Acme Machinery Company, manufacturers of bolt and nut machinery, say their domestic trade has shown an improvement during the past month, while the foreign demand has shown a marked decline, nearly every country, with the exception of Great Britain, showing up poorly. They are making a large shipment of tools to the British Westinghouse Company.

The Kilby Mfg. Company have taken a contract to build and equip another beet sugar plant, making four under contract for next year. The plant is for the Eaton Sugar Company, Eaton, Col., and it will have a daily capacity of 600 tons. Each of the plants will be equipped with a complete machine shop, lighting plant and power plant. Engines of about 300 horse-power and boilers of about 2000 horse-power will be required for each. The Kilby Company are desirous of hearing from manufacturers of Scotch type of boilers.

E. H. Dyer & Co., beet sugar machinery builders, have taken a contract to build and equip a plant at Greeley, Col., for the Wheeler Sugar Company. They will furnish the complete outfit and will be on the market for machine tools, engines, boilers, electrical machinery, &c. They state that they expect to close contracts for additional plants in the near future.

The Brown Hoisting Machine Company are pushing the work on their new plant and hope to have it under cover before the severe weather sets in. Their temporary shops are crowded with work. At present they notice an unusual demand for their patent blast furnace hoists and distributors. They have just closed a contract for a large coal handling and storage plant which is to be erected next spring at the head of the lakes.

The McMyler Mfg. Company, manufacturers of hoisting and conveying machinery, who are erecting a large plant at Warren, Ohio, are calling for bids for the equipment of the plant. In addition to a good list of machine tools they are on the market for two horizontal boilers, 100 horse-power each, to be equipped with mechanical stokers; feed water heaters for 300 horse-power boilers and pumps for same; a 100-kw. 250-volt generator direct connected to engine and a number of motors.

The Standard Machinery & Equipment Company of this city and McDowell & Co., Pittsburg, have recently bought up a very large lot of power and electrical equipment of the various sub-stations of the Cincinnati Gas & Electric Company, who are preparing to build a large central station. Among the items are two Allis tandem compound Corliss engines, 500 horse-power each; two Corliss engines, 450 horse-power; two 500 horse-power engines; 20 boilers of various makes, 150 horse-power each; three 150-kw. direct connected Westinghouse generators, two 200-kw. Woods alternators.

The Wellman-Seaver Engineering Company are now making excellent progress in the erection of their new plant. Their pattern shop, one of the most complete of its kind in the country, has been placed in operation, and they expect to have their machine shop and erecting shop in operation about the first of the year.

The Cleveland Wire Spring Company will commence shortly on extensive additions and alterations to their plant. They will erect two buildings, one 130 x 40 feet and one 140 x 35 feet, for their japanning and tempering departments, respectively, and will add three stories to one of their present buildings and two stories to another. Their office will be removed to one of the additions and will be equipped with all modern conveniences. They will add to their power capacity and are on the market for engines and boilers, and will also add con-

siderable new machinery. The improvements were made necessary through a marked increase in their business during the past year and through the introduction of new lines of sheet metal goods.

It is denied at the local headquarters of the Westinghouse Electric & Mfg. Company that the old Walker plant, now operated by them, is to be dismantled and abandoned. It is stated that the report arose from the fact that they are calling for bids on a number of tools for the manufacture of motors, the production of these goods having been abandoned at the local plant.

C. O. Bartlett & Co. have taken a contract for a coal handling outfit to be erected at Sandusky, Ohio, for the Columbus, Sandusky & Hocking Railway. It will be similar to the outfit they are erecting at Conneaut and will have a capacity of 700 tons per hour.

The Everett-Moore syndicate, who own and operate over 1500 miles of electric interurban and city lines between Warren, Ohio, and Port Huron, Mich., have purchased a site in Toledo and will erect large machine and repair shops, which will take care of the repair work for a large portion of their system. Later they intend to erect similar shops in Cleveland and Detroit. Charles W. Wason, Electric Building, Cleveland, is purchasing agent for the syndicate.

The Cleveland Faucet Company are erecting a new plant, and are said to be on the market for brass and wood working machinery.

The Abbott Electric & Mfg. Company, manufacturers of metal novelties, are preparing to remove their plant from Cleveland to Warren. The company have been reorganized and considerable new machinery is to be added to the equipment being moved from Cleveland. J. Joyce, until recently an engineer with the King Bridge Company, will be manager and superintendent.

Representatives of the Muncie Steel & Iron Company, Muncie, Ind., have been in Cleveland the past week looking for a manufacturing site. It is said they desire to locate in Cleveland.

The Johnson & Jennings Company, manufacturers of castings, are preparing plans for the erection of a large plant of six buildings at the intersection of Madison avenue and the Lake Shore tracks. They are desirous of leaving their present location on Merwin street.

P. H. Lavan, secretary-treasurer of the Inter-State Foundry Company, has secured a building site adjoining their present foundry and is making plans to erect an addition next spring.

The Winton Motor Carriage Company have increased their capital stock from \$200,000 to \$1,000,000, and are making preparations to make important extensions to their plant. They have recently installed several pieces of new machinery, among them a worm milling machine of new design built by the Cleveland Machine Screw Company.

The Sterling Boiler Company have broken ground at Barberton for additions which will almost double the capacity of their boiler plant in that place. There will be five new buildings, each 150 x 65 feet. Immense demand for marine boilers has necessitated the increase of capacity.

Additions and improvements will be made to the plant of the A. C. Williams Iron Works at Ravenna. The output will be increased over 40 per cent., and employment will be given to 225 men.

L. A. Smart and W. C. Bruce of this city are dickering with the Chamber of Commerce at Elyria, with a view to establishing a foundry and machine shop in that city. It is stated the concern will be known as the Chemical Foundry Company, and it is proposed to invest \$200,000 in the business. There will be a gray iron foundry, 200 x 60 feet, designed for taking care of heavy work; a machine shop and later a steel foundry. They agree to employ 150 men at the start and 300 in three years, if the town will make certain concessions.

The Lima Locomotive & Machine Company, through the Cleveland Trust Company of Cleveland, have completed a land deal with the Board of Trade of Lima, Ohio, whereby the locomotive company are to erect a new car plant and employ not less than 600 men by November 1, 1902.

The Boston Machinery Market.

BOSTON, MASS., October 26, 1901.—One of the most extensive works undertaken for a number of years in Eastern Massachusetts is in progress at Readville, a part of the town of Hyde Park, about 12 miles out from Boston, on the New York, New Haven & Hartford road. Great shops are rising in a broad level tract beyond the railroad station alongside of the Dedham branch line, the plant that has been planned covering an area of many acres, and being designed to include machine shops, repair works and the necessary equipment for such an adjunct to the big railroad's eastern terminus. It is anticipated that the plant in Readville will bring from Norwood and other points where the railroad company now have repair and construction plants upward of 4000 new residents to Hyde Park as a permanent addition to the population of the place.

Foundation walls for the B. F. Sturtevant Company's new shops at Readville are also rapidly progressing, and the importance of Hyde Park as a manufacturing community will be greatly enhanced in the near future. Among the large industries heretofore located there in the machinery line are the American Tool & Machine Works and the Becker-Brainard Milling Machine Company's plant.

The Niles Tool Works Company, Bement, Miles & Co. and Pond Machine Tool Company, Charles H. Kingsbury, manager, removed their Boston office this week from 65 Oliver street to 144 Pearl street. Hereafter the Niles Tool Works Company will conduct their power transmission business and the sale of all wrought steel pulleys at 69 Purchase street. The company will carry also a line of second-hand tools at the latter address. Mr. Kingsbury reports that business is good, and that there are brisk inquiries for goods handled by the companies he represents.

George S. Githens, New England manager of the Ingersoll-Sergeant Drill Company, reports the following contracts made by his company: A large plant on section 13 of the Massachusetts Water Works and Sewer, two 18 and 18½ x 24 air compressors and ten rock drills for the Columbus Construction Company of New York; a Class E electrically driven air compressor and two rock drill equipments complete for the United States Navy Yard at Portsmouth, N. H.; an 18 and 24½ x 24 Class A air compressor for the National Contracting Company, to be used at Jamaica Plain, Mass.; an air compressor, 14 and 14½ x 18, for the Stanley Works, New Britain, Conn.; a small air compressor for the Benedict & Burnham Mfg. Company, Waterbury, Conn.; two large air compressors for the Copperfield mines, Copperfield, Vt.; a small air compressor for Beggs & Cobb, Winchester, Mass.; a large Class G air compressor for the Eastern Shipbuilding Company, New London, Conn.; a rock drill outfit for the Coos Mining Company, Littleton, N. H.; a large air compressor for the New England Structural Company, Boston; a large Class G air compressor for the Yale & Towne Mfg. Company, Stamford, Conn.; two rock drill outfits for the Conway Contracting Company, Greenwood, Mass., and rock drill outfits for the sewer and street departments of the city of Boston.

F. H. Hayes, New England agent of the Stilwell-Bierce & Smith-Valle Company, reports the placing of the following contracts: An electrically driven sewage pump of 5,000,000 gallons capacity for the city of Pittsfield, Mass.; a vacuum pump and condenser and a fire pump for the West Medfield, Mass., Electric Light & Power Company; an electrically driven power vacuum pump for the Brookline, Mass., Gas Light Company; a large vacuum pump for the Quincy Point, Mass., plant of the Old Colony Street Railway Company, and an electrically driven pump for elevator service in the store of Houston & Henderson, Boston.

A cable dispatch from London reports the success of experiments made a few days ago in Buckinghamshire, England, by Messrs. Armstrong and Orrin of a new system of wireless telegraphy and telephony, using earth currents instead of air currents, as in the Marconi system. Operations were readily conducted over a distance of 500 yards.

HARDWARE.

THEORIES OF HARDWARE DISTRIBUTION.

It is easy to form plausible theories which promptly break down in practice. Among these is the view frequently promulgated that under ideal conditions the Hardware manufacturers should dispose of their products to the jobbers, who should in turn sell them to the retail merchants, through whom alone they should reach the consumers. The interests of the trade would thus be admirably served, provided the plan worked consistently and smoothly and the manufacturer, jobber and retailer did each a satisfactory and profitable business without interference from the other great classes of the trade. It is found, however, that in practice there are many and serious disturbances with this very pretty theory for the distribution of Hardware. The retailer finds his trade invaded by both the jobbers and the manufacturers. It is deemed necessary frequently for the manufacturer to pass by the jobber and sell to the retail merchant, and in many cases even to the consumer. The jobber, in his special brands and in other ways, not infrequently poses as a manufacturer on the one hand, and on the other sells to the public either openly through a retail department in his establishment, or in a more covert way reaches the larger consumer, whose trade is solicited by his traveling salesman. There is thus a constant conflict of trade interests as competition refuses to be restrained out of respect for the theory.

Inquiries were recently made among a number of houses scattered throughout the country doing a retail business, with a view to ascertaining whether certain leading goods were purchased by them from manufacturers or from jobbers. The houses selected were taken indiscriminately from a list of retail merchants and represented a wide range, in capital, size and extent of business. Many of them were very small concerns doing a limited trade, while others occupied a much larger field, and were perhaps nearly as important as some houses who have succeeded in being classified as jobbers. In accordance with the theory of distribution which we are considering they were all retailers and should purchase their goods exclusively from the jobbers. As a matter of fact, however, it was found that the majority of them purchased the goods in question from the manufacturers, as is shown in the following tabulation of the results of the inquiry:

	Number of Merchants Buying	
	From Manufacturers.	From Jobbers.
Forkes, Hoes, Rakes, &c.....	63	63
Refrigerators	69	38
Wire Fencing.....	114	42
Lawn Mowers.....	106	39
Wire Cloth and Poultry Netting.....	68	51
Window Screens and Doors.....	72	60
Ice Cream Freezers.....	57	81
Stoves and Stove Goods.....	95	8
Axes	84	50
Furnaces and Heaters.....	66	2
Guns and Rifles.....	43	61
Snow Shovels, &c.....	52	59
Meat Cutters, &c.....	50	85
Holiday Goods.....	47	53
Skates	43	86
Sleds	45	45

It will thus be seen that in the line of Steel Goods, Hoes, &c., 63 of the merchants reported that they bought from the manufacturers, and precisely the same number that they bought from the jobbers. In Refrigerators the retailers dealing directly with the manufacturers

were 69, while only 38 purchased from the jobbers. In Wire Fencing and Lawn Mowers there is a striking preponderance in the direct relations of the manufacturers with the retail merchants.

The facts above recited indicate the extent to which the theory of distribution under discussion is disturbed to the detriment of the jobber. If the theory were consistently carried out the figures we have given would show that in the lines in question the jobber's business would be largely increased, both as to the number of his customers and still more in the volume of his sales. There is doubtless a similar interference with the business of the retailer, who is not by any means permitted to monopolize the sale of goods to the consuming public. Thus both jobber and retailer suffer together from the existing conditions. The manufacturer, too, it is well known, has troubles of his own and grievances against both the classes of trade with whom rests the distribution of his products. The theory seems to endure but poorly the tests to which it is subjected in the stress of competition and the looking out of each for his own interests. Whether it is feasible or in a broad sense desirable to bring trade back into the suggested channels—to which, by the way, it has never been confined—is a question in regard to which there is a wide diversity of opinion.

Condition of Trade.

There is little reason for complaint in regard to the volume of business. The time of year has come when stocks are normally in good shape and attention is being given to the marketing of goods by merchants, both wholesale and retail. All the reports indicate that in both these branches of trade there is an excellent demand. It is the season when retail business is usually active and goods in considerable variety are being disposed of. In the line of Builders' Hardware there continues to be a demand which in several lines takes up the products of the factories as fast as the goods are turned out, and a good deal of inconvenience is occasioned by the delay in executing orders. Season goods also are moving steadily and in large quantities, with the result of making something of a scarcity in some kinds. Holiday trade is receiving attention, as enterprising merchants are getting ready for it and preparing to avail themselves of the opportunity which the season presents. Some lines which have been in short supply and on which the manufacturers have been far behind their orders are giving less cause for complaint and are being turned out by the mills more promptly. This is the case with Barb Wire, Wrought Iron Pipe, Tin Plate, Sheets, and other heavy lines. The tone of the market is on the whole excellent. Prices as a rule are steady and well maintained, but there are some soft spots. For example, Steel Goods and Scythes are showing a decided weakness. Shovels and Spades are regarded with suspicion, and the trade are looking for developments. Wire Nails, while regular quotations continue unchanged, are being cut to a certain extent, owing to the entrance into the market of outside competition. It is to be noted that in all these cases the weakness is the sequel to the maintenance for a comparatively long time of high combination prices. On the other hand, the general tone of the market is decidedly good. Some lines have been slightly advanced of late, and in many others in which no change has been made the cost of the raw material and advances in wages are adding to the cost of the goods. Conservative manufacturers are, however, reluctant to make advances and are

satisfied at present to hold more firmly to their established prices and are less anxious to contract for future delivery. In some branches of trade the demand upon the factories is so large that they are not able to do more than execute orders and are given no opportunity to accumulate stocks. It is obvious that the trade will enter on spring business with a comparatively small supply of goods in many lines and the possibility of a shortage is contemplated. Export trade presents few new features, but on the whole is of satisfactory volume so far as Hardware and miscellaneous manufactured products in the metal line are concerned.

Chicago.

(By Telegraph.)

The local wholesale Hardware trade is this week enlivened by the presence at Chicago of many Hardware merchants who have taken advantage of the last merchants' excursion of the season to visit the markets and make or renew acquaintanceship with the people from whom they have been purchasing. Their visits almost invariably mean generous orders. The warm weather this week has stimulated demand for some goods that would otherwise be passing away, but it is also checking the demand for other goods, among which are Stove Pipe, Elbows, Hods, &c., in which there has been little trading this week. But in goods not especially susceptible to weather conditions trade has been excellent. It surpasses that of the previous week or two. The shipping floors of jobbers present an animated appearance and the variety of the goods ordered is very wide. The prices of Hickory Handles are higher. Nuts and Bolts also have again been marked up. Demand continues exceptionally good in Mechanics' Tools and the inquiry comes from all parts of the West. The demand for Heavy Hardware is not quite so brisk as a month ago, but this is attributed to a slowness on the part of consumers to accept recent advances as permanent. In the matter of consumption there is no unfavorable symptom. Small manufacturers are running busily and because of slow mill or factory shipments are often paying premiums for spot goods.

St. Louis.

(By Telegraph.)

The demand continues for all lines of goods and there is noted a confident feeling in the buyer, made apparent by his providing well ahead for his season's requirements. Prices generally hold very firm, but a shading in Wire prices affects Nails and will naturally be felt in Barb Wire. Activity in the heavy department of the market seems, if anything, to be on a broader scale, and every indication points to larger requirements in the near future. In the Hardware line, as in other branches of the market, a very annoying and it might be said serious handicap is the slow delivery and dispatching of goods by the railroads, due, it is said, to shortage of cars. It is hoped with the very general complaints on this point that some extra effort will bring about a speedy relief. If it continues it is feared it will seriously interfere with the extensive building operations now in progress.

NOTES ON PRICES.

Wire Nails.—The country is still requiring a large volume of Wire Nails to supply demands, but these are being usually met by orders for comparatively small lots. The trade generally are of the opinion that Nails will be no higher in the immediate future, while competition points to lower prices. Concessions are being made, owing to competition, of from 5 to 10 cents per keg in some cases, although no change has been made in the regular quotations. Irregularities extend to prices made by jobbers to the smaller merchants, as differentials between jobbers' and retailers' prices are not usually maintained. We continue to quote, as representing the market in a general way, \$2.30 for carload lots to jobbers and \$2.35 in less than carload lots, f.o.b. Pittsburgh.

New York.—Wire Nails are moving in satisfactory volume in the local market, though retail merchants are or-

dering in small lots, for the most part. As a result of the efforts made by new manufacturing concerns to secure business by offering Nails at lower prices than the regular quotations, local prices have been affected. Small lots of Nails at store are sold at \$2.50 to \$2.55, and carloads on dock at \$2.35 to \$2.45.

Chicago, by Telegraph.—The demand for Wire Nails is quite satisfactory. It is particularly lively in the West and Southwest. Mills are making prompt shipments, but are not accumulating stocks. Some time between now and the turn of the year it is expected that stocks can be secured against a demand like that of last spring. From store demand runs up well into former tonnage, but it is quite noticeable that buyers are restricting purchases to immediate wants. It is only the large consumption that makes the current volume of business generous. Prices are not strong. Jobbers are generally quoting carloads at \$2.40, and small lots \$2.45.

St. Louis, by Telegraph.—There is a shading in prices in Wire Nails, but it is not very material, and we therefore make quotations as before: Carload lots to retailers at \$2.50, and less than carload lots at \$2.55 to \$2.65.

Pittsburgh.—As far as demand is concerned, the Wire Nail trade is in very satisfactory condition, buyers sending in orders fast enough to take the output of the mills about as fast as made. However, there is a good deal of irregularity in prices, and we may note that the carload price of \$2.30 at mill is being very materially shaded, in some cases more than 10 cents a keg. For certain points of delivery, however, established prices are being firmly held. We have as yet made no change in prices, and quote the general market as follows, f.o.b. mill, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.30
To jobbers in less than carload lots.....	2.35
To retailers in carload lots.....	2.40
To retailers in less than carload lots.....	2.50

Cut Nails.—Manufacturers of Cut Nails, owing to their inability to obtain steel, are still in arrears. It is understood that some mills are from 15 to 30 days behind on orders. In some sections there appears to be a scarcity of cars, which results in an additional delay in shipments. The urgency of the retail trade for Nails probably makes the demand appear larger than it really is. It emphasizes not so much the volume of requirements as the scarcity of the goods. The regular monthly meeting of the Eastern Cut Nail Association is scheduled for the latter part of this week. Quotations are as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$2.05
Less than carload lots.....	\$2.10 to 2.15

New York.—Local stocks of Steel Cut Nails continue to be somewhat broken in assortment, owing to the scarcity of some sizes. There is little difficulty in obtaining Iron Cut Nails, but, while these are preferred in some sections, they are not always regarded with favor by the trade at large. New York quotations for carload and less than carload lots are as follows:

Carload lots on dock.....	\$2.18
Less than carload lots on dock.....	2.23
From store	\$2.18 to 2.30

Chicago, by Telegraph.—Demand for Cut Nails is fairly good, and prices remain unchanged at \$2.35 in small lots.

St. Louis, by Telegraph.—The demand and inquiry for Cut Nails is satisfactory, and prices are unchanged. Small lots from store are quoted at \$2.30 to \$2.35.

Pittsburgh.—There is some difficulty in getting prompt delivery of certain sizes of Cut Nails, owing to great scarcity of Steel. This, as noted last week, is leading to a larger use of Iron Cut Nails. We quote for domestic trade, f.o.b. Pittsburgh, plus Tube freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$2.05
Less than carload lots.....	2.10

Barb Wire.—Requirements for Barb Wire are diminishing as the season advances, although it continues remarkably good in some sections. Irregularities in prices

continue for delivery at some points, but for the most part the market is remarkably steady and well sustained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....	\$2.60
To jobbers in carload lots, Galvanized.....	2.90
To jobbers in less than carload lots, Painted.....	2.65
To jobbers in less than carload lots, Galvanized ..	2.95
To retailers in carload lots, Painted.....	2.70
To retailers in carload lots, Galvanized.....	3.00
To retailers in less than carload lots, Painted.....	2.80
To retailers in less than carload lots, Galvanized..	3.10

Chicago, by Telegraph.—Sales of Barb Wire continue large, a notable percentage of trade coming from the Southwest. The open weather is also helping the trade in more northerly districts. Prices are unchanged. Carload lots are quoted at \$2.75 for Painted and \$3.05 for Galvanized. Less than carloads are quoted \$2.85 and \$3.15, respectively, with these prices firmly held.

St. Louis, by Telegraph.—The demand for Barb Wire continues good. In sympathy with the shading in the price of Wire it would seem that prices might be expected to tend lower in this department. Jobbers quote carload lots of Painted at \$2.85 and Galvanized at \$3.15; less than carload lots at \$2.95 for Painted, \$3.25 for Galvanized.

Pittsburgh.—There is only a fair amount of orders being placed for Barb Wire, and prices, owing to competition, are being more or less shaded, depending on the order and point of delivery. A good deal of Wire is going abroad. For domestic trade we quote: Galvanized Barb Wire, \$2.90 in carload lots to jobbers, and Painted, \$2.60. Terms, 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

Plain Wire.—There is somewhat of a diminished demand for Plain Wire, although it continues satisfactory. Mills continue busy and are not accumulating large stocks. In the matter of price there is some irregularity at competitive points. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots.....	\$2.25	\$2.65
To jobbers in less than carload lots.....	2.30	2.70
To retailers in carload lots.....	2.35	2.75
To retailers in less than carload lots.....	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9.....Base.....					\$0.40 extra.
10.....	\$0.05	advance	over	base.....	.40 "
11.....	.10	"	"	"	.40 "
12 and 12½.....	.15	"	"	"	.40 "
13.....	.25	"	"	"	.40 "
14.....	.35	"	"	"	.40 "
15.....	.45	"	"	"	.75 "
16.....	.55	"	"	"	.75 "
17.....	.70	"	"	"	1.00 "
18.....	.85	"	"	"	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—Trade in all kinds of Plain Wire is reported to be gratifying for this season. Consumption among the manufacturers is large and makers are not accumulating stocks. Carload lots of Wire are held at \$2.40 and small lots from stock at \$2.50.

Pittsburgh.—Demand keeps up and the output of the mills is shipped as fast as made. It is said that prices on Plain Wire are shaded only for desirable orders and for certain points of shipment in competitive territory. For domestic trade we quote:

To jobbers in carload lots.....	\$2.25
To jobbers in less than carload lots.....	2.30
To retailers in carload lots.....	2.35
To retailers in less than carload lots.....	2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

Building and Roofing Papers.—Manufacturers of Building and Roofing Papers report some recent advances in price, despite the active competition, of which there are some indications in both Tarred and Rosin

Sized Papers, as well as that of asbestos material. Tarred Felt, single ply, can be bought in round lots as low as \$25 per ton, although common quotations are \$26 to \$28 per ton. Two-ply Felt is offered at 45 cents per roll, and three-ply at 65 cents per roll, of 108 square feet each, quite generally; 40 and 60 cents being, however, named to close buyers, while small lots to the average buyer are 50 and 75 cents, respectively. In Chicago and contiguous territory, where competition between two powerful rival concerns is intense, Tarred Single Ply Roofing Felt has been advanced on ton lots to \$23 to \$25 per ton, as low as \$20 per ton having been made earlier in the season for exceptional orders. There is also a disposition to harden the price for Rosin Sized Sheathing, this market having been affected in a measure by the burning down last month of one of the four principal factories, followed by a conference of the remaining concerns at which it was decided to advance prices somewhat. The price to the average buyer now is about \$28 per ton to all outside of a few exceptionally large dealers to whom \$25 has been made, and in one or two instances a further concession of \$1. Manufacturers and dealers both refer to the difficulty of executing or getting orders filled, and further advances are predicted for next month. Deadening Felt is quoted variously at \$35 to \$37 per ton, this material regularly advancing in the fall and receding in the spring.

Asbestos Building Felt and Mill Board 1-16 inch thick and less is being sold as low as 2½ cents per pound. Mill Board thicker than 1-16 inch and Sheets, 40 x 40 inches, 3½ cents per pound, which, in some cases, has been shaded to 3¼ cents.

Packing.—Asbestos Rope and Wick Packing varies between the extremes of 13½ and 18 cents per pound for the customary staple qualities, the finer grades being very much higher.

Cordage.—Owing to a sudden advance in the price of Manila Hemp, the price of Manila Rope was advanced 1 cent per pound by manufacturers, on the 28th inst. While there is no change in prices of Sisal Rope, the market is not as strong as it was a week ago. There continue to be irregularities in prices, these varying with different manufacturers. General quotations on a basis of 7-16-inch and larger, with a rebate of ¼ cent per pound for large quantities, are as follows:

	Cents per pound.
Manila Rope.....	12¾ to 13
Sisal Rope.....	8¾ to 9¼

Glass.—At a recent meeting of the National Window Glass Jobbers' Association, a resolution was passed permitting the jobbers of the various large cities in the country to establish such prices in their districts as they think will be for the best interest of the American trade. For the present, instead of a uniform price being adhered to in the different districts covered by the jobbers' association, the local jobbers in the various cities will make their own prices. It is understood that a change in price, covering the whole list or a single bracket, may be made. This action was decided upon, it is reported, in order to head off importers, who, it is said, have been bringing in foreign Glass and selling it at a lower price than has been charged for domestic Glass. The impression prevails that the market is not in as desirable condition as reports would indicate. Manufacturers have more Glass on hand than they expected to have at this time, and the same is true of many jobbers. In fact, the demand has not been nearly as large as was anticipated. Glass is so high in price that stocks are being cut up to sizes by the trade rather than order any more. The factories of the American Window Glass Company and the Independent Glass Company are expecting to go into operation November 1. These two concerns have a combined capacity, it is stated, of 2336 pots. It is not expected that they will be able to operate to their full capacity, owing to the scarcity of workmen. No change has been made in local quotations, which are as follows:

	Discount.
Less than car lots, from store.....	.80 and 20 %
Carloads, f.o.b. factory.....	.85 and 5 %

Paints and Colors.—*Leads.*—White Lead in Oil con-

tinues in good fall demand; in fact, trade in this line has been very satisfactory since cooler weather set in. Prices continue somewhat irregular, varying according to manufacturer and size of order. There is a report in circulation that a reduction in price is contemplated of $\frac{1}{4}$ cent per pound. This report, however, is without official confirmation. Quotations are as follows: In lots of 500 pounds or over, $6\frac{1}{2}$ cents; in lots of less than 500 pounds, 7 cents per pound.

Oils.—*Linsed Oil.*—The general condition of the Linseed Oil market is unchanged. Spot Oil continues scarce, and crushers are only shipping small lots on October contracts. Until crushers buy seed more freely and demand falls off with the advent of cold weather, there is not much prospect of the situation improving. These conditions are expected to be reached during the month of November. For immediate delivery City Raw is quoted from 65 to 66 cents, according to quantity. Out of town Raw is quoted from 62 to 66 cents, according to quantity. Boiled Oil is 2 cents per gallon advance on Raw.

Spirits Turpentine.—The Turpentine market has fluctuated but little, and quotations are now the same as a week ago. Local stocks are not large and receipts at Southern points are not heavy. Indifference on the part of large buyers in this market, which confines the demand to small lots, results in a comparatively small amount of business. Quotations, according to quantity, are as follows: Southern, $38\frac{1}{2}$ to 39 cents; machine made barrels, 39 to $39\frac{1}{2}$ cents per gallon.

Farm Bells.—The market in School and Farm Bells has a strong tone, and prices are reported as well maintained. The manufacturers as a rule are very busy, and are not desirous of heavy orders for future delivery.

Wire Cloth.—The prices for Wire Cloth for the coming season have not yet been determined by the manufacturers, but it is anticipated that the question will be settled in the near future.

PRODUCTION OF CUT NAILS IN 1900.

THE statistics of the production of Iron and Steel Cut Nails and Cut Spikes in the United States in 1900 have been compiled by the American Iron and Steel Association. They do not embrace railroad and other Spikes made from bar iron, Wire Nails of any size, or machine made Horseshoe Nails. Only Spikes cut from plates are included with Cut Nails.

The total production of Cut Nails in 1900 was 1,573,494 kegs of 100 pounds each, against 1,904,340 kegs in 1899, a decrease of 330,846 kegs, or over 17 per cent. In 1886 the maximum production of 8,160,973 kegs was reached. In 1900 the production of Wire Nails exceeded the production of Cut Nails by 5,660,485 kegs, in 1899 by 5,713,790 kegs, in 1898 by 5,846,254 kegs and in 1897 by 6,890,446 kegs.

Ten States made Cut Nails in 1900, the same number as in 1899. The following table shows the production of Iron and Steel Cut Nails by States from 1897 to 1900, in kegs of 100 pounds. The Wire Nail production for the same years is added to the table:

States—Kegs.	1897.	1898.	1899.	1900.
Pennsylvania	1,057,964	768,171	920,133	777,611
Ohio	411,396	392,003	386,215	261,216
West Virginia and Indiana	290,203	184,942	178,006	168,469
Massachusetts and New Jersey	142,021	127,706	149,700	155,968
Illinois	34,000			
Maryland, Virginia and Kentucky	164,465	87,399	255,286	193,230
Missouri, Colorado, Wyoming and California	6,750	12,000	15,000	17,000
Total Cut Nails . . .	2,106,799	1,572,221	1,904,340	1,573,494
Total Wire Nails . . .	8,997,245	7,418,475	7,618,130	7,233,979
Grand totals	11,104,044	8,990,696	9,522,470	8,807,473

The Wheeling district embraces the Nail mills in Ohio and Marshall counties in West Virginia and in Belmont and Jefferson counties in Ohio. There were 186,397 kegs of Cut Nails made in this district in 1900, against 178,006 kegs in 1899, 282,908 kegs in 1898, 292,950 kegs in 1897, 305,881 kegs in 1896, 347,742 kegs in 1895, 416,329 kegs in 1894, 1,848,116 kegs in 1887 and 1,858,551 kegs in

1886. Allegheny County, Pennsylvania, has not made any Cut Nails since 1890, but it is now a large producer of Wire Nails.

THE AMERICAN MANUFACTURER.

BY OUR LONDON REPRESENTATIVE.

MY recent journey through the iron and steel centers of the United States has further impressed me with the fact—for fact it is—that the American manufacturer is not only unique in his methods, but unique in himself. To what extent this is due to the habits and conditions of the country or to special education and training, it is not for me to determine. Certain it is that he is unlike the manufacturers of other countries. Both in temperament and outlook he stands by himself—a star apart.

Characteristics of the American Manufacturer.

What are his distinguishing features? I think they are frankness, adaptability, originality and a striking aptitude for associated work. Of course, he has the defects of these qualities. He seems to me to be unduly optimistic and a little too much in a hurry. Conscious as he is that his trade methods are not only unique, but, on the whole, superior to any that obtain elsewhere, he thinks, not unnaturally, that the world can easily be commercially conquered. Vain hope! The buyer in other countries has become habituated to the ways of the manufacturer of the Old World; he must be imbued with American ideas before he can become a steady and regular customer. And the Old World buyer is conservative to his backbone.

American Frankness.

To one accustomed to English habits, the most striking feature of American trading is its frankness. At first I found myself afraid to ask questions upon points that piqued my curiosity—questions which if asked in England would have subjected me to a polite snub. Soon this feeling passed away, and I do not remember being refused information of any sort. This frankness has its drawbacks, but its advantages are so obvious that Americans have now learned that "frankness is the best policy." This is, I think, generally conceded.

A Discriminating Adaptability.

The extraordinary adaptability of American manufacturers still continues to distinguish them, but I think I detected signs that this will not always be so. Production in large quantities is the order of the day, and it is becoming increasingly difficult to make to special patterns. In addition, the problem how best to market the ordinary products of the large mills will become acute in the near future. Output must be maintained. I take this to be a cardinal American business principle. If so, the manufacture of special lines to meet special needs is apt to become a drag upon business. It is often urged against British manufacturers that they try to force their ordinary products upon localities that demand a special pattern. The British manufacturer is, in consequence, dubbed "slow" and "behind the times." But there can be too much adaptability in this direction. Readiness to make special lines at remunerative prices is necessary; but it often requires a power of real discrimination to choose what special lines are worth making or what should be rejected. The British manufacturer is not an infant in the business, and long experience has taught him that if he can successfully force his "bread and cheese" lines upon the market, he is so much the better off. There are, however, various kinds of adaptability. One consists in a keen promptness to introduce good machinery. Here the American excels beyond all others.

Impressions of Representative Works.

My pilgrimage through many factories has been an education. Nowhere, either in Europe or England, have I seen such ingenious machinery so cleverly applied. The works of the Enterprise Mfg. Company, at Philadelphia, are model in every sense of the word, while in the actual manufacture of machine tools I will long remember the factory of Brown & Sharpe, at Provi-

dence, R. I., and two or three similar concerns at Cincinnati. I do not think that I observed any great superiority of actual workmanship over what one sees in Great Britain; in some respects, particularly in foundry work, I think the British retain their old time superiority; but I do not believe that anywhere on the other side of the Atlantic can be found so much ingenuity and willingness to adopt new ideas.

Originality a Factor in American Success.

Much of the American success is due to originality of design. This cannot be too strongly enforced. The moment an American article ceases to be original or the patent lapses it is instantly copied in both England and Germany. This is especially true of domestic Hardware. Meat Choppers, Raisin Seeders, Carpet Sweepers, Freezers, have all a story to be told of successful imitation. So, too, have Carpenters' Tools and Builders' Hardware. And if either the British or the German manufacturer cares to imitate American specialties that are not protected by patent, there is no reason why he should not make them as cheap or cheaper than the original manufacturers. However, so long as Americans maintain their reputation for originality they will not only hold their own in the export trade, but gain ground. I should like to utter a word of warning against regarding cheapness as the chief consideration. Much harm has been done to American interests by flooding the market with cheap American specialties that have really nothing to recommend them beyond a certain superficial originality and cheapness. These articles are purchased, and possessing no durability, users are apt to think that American goods generally possess no real value.

The Faculty of Combination.

Of the American's ability to combine for trade purposes I have already written in a previous article. No doubt this capacity for association is really a variation of the habit of frankness. If candor becomes part of our business make up, it is only one step to a trade association.

Accessibility.

My experiences among American business men have been exceedingly pleasant. Everywhere I have found them easily accessible and anxious in every way to make my visit enjoyable. No wonder that Englishmen who come once to America count the days until they come again! In America business is a pleasure.

REQUEST FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

Waterman Hardware Company is the name of a new Hardware concern, recently incorporated, who will open up November 15 at 141 South Pearl street, Albany, N. Y. They will deal in Builders' and General Hardware, Tools, Kitchen Utensils, &c., and will be pleased to receive from manufacturers illustrated catalogues, price-lists, quotations, &c. George Waterman, the president and treasurer, is a native of Albany and learned the business with the old house of M. E. Viele of that city. He has had 12 years' experience, six of which were with the Alerton-Clarke Company and two years with Tower & Lyon, both of New York, whom he represented as traveling salesman.

TRADE ITEMS.

THE CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio, have recently opened a store at 17 South Canal street, Chicago, where they will carry a full and complete stock of all their manufactures for the benefit of the trade in that city and vicinity. The store will be in charge of John G. Ladrack, who has represented the company in the West for a number of years.

THE ANGLO-AMERICAN EXPORT AGENCY have been established at 95 and 97 Liberty street, New York. This company will give their attention to introducing American Hardware and other goods in the English market, with which, they advise us, they have already estab-

lished connections, and thus have an acquaintance and a corps of travelers which will be of service in marketing American products. Besides representing manufacturers as their agents, they will buy goods and sell them through their representatives abroad.

SHOW WINDOW DISPLAY.

The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.

A HARVEST WINDOW DISPLAY.

A novel scheme for attracting the attention of both the farming and the city population was employed last fall by the progressive firm of Smith & Bishel, Middletown, Conn. It consisted of a display of farm products, and turned out to be far more successful as an advertising medium than had been anticipated.

One of the members of the firm spent two days with horse and buggy calling on various farmers living in the vicinity of Middletown, telling them that they were going to devote one of their show windows to exhibiting farm products. Each farmer was asked to send whatever he thought would be of interest. The result was surprising. Wagons bearing the best of the crops came in from all directions and stopped in front of the Hardware store. The variety and quantity of things brought were astonishing. Fruits of many varieties, all the choicest, were put into the window. The finest grain, both in sheaf and threshed, was submitted. Some gigantic cornstalks that almost reached the ceiling were placed in the back of the window. Vegetables of all kinds were put wherever there was a place for them, the center attraction being a squash weighing 250 pounds. The display was kept up for a week and awakened a keen interest among the farmers, in which the townspeople heartily joined.

Each day some of the farmers would bring in fresh products which were substituted in the window for those that had been there for a day or two. In this way the exhibit was kept continually fresh and attractive.

The interest aroused formed a great advertisement, while many of the farmers who submitted their products made purchases in the store, some of them for the first time. It may be incidentally mentioned that enough fruits and vegetables were left to stock the private cellars of the members of the firm for the entire winter, although this was not thought of when the farmers were asked to submit their best products for exhibition.

DISPLAY OF EMPTY BOXES.

An enterprising Connecticut house, desiring to increase their sales of a certain line, after placing a large order with the manufacturer's representative made the request that they be loaned a couple of gross of the empty collapsible boxes in which the article is packed. These were gladly furnished and were placed in the show window, almost filling it. The effect produced was striking. An attractive card called attention to the fact that the store carried the largest stock in town of the article shown. Many people came in and made purchases, the remark being frequently made that they did not see how such a large stock could be sold in years.

This method of calling attention to goods is not a new one, but where it has not been used it may perhaps be worked to advantage.

SAMPLING DRAWER PULLS.

IN the Hardware store of J. D. Law, Springfield, Mass., can be found a novel method of sampling Fancy Brass Drawer Pulls. A sample of each variety carried in stock is sewed to a piece of maroon felt. This is kept in a drawer, and when a customer asks for a Drawer Pull it is brought out and laid on the counter before him, giving him an opportunity of seeing at a glance the entire assortment from which he may select.

PAN-AMERICAN EXHIBITS.

Keuffel & Esser Company.

The Pan-American exhibit of Keuffel & Esser Company, 127 Fulton street, New York, consists principally of Drawing Materials and Surveying Instruments, especially the latter. Their line of Measuring Tapes, of which they are large manufacturers, is also represented.

Edward Miller & Co.

Edward Miller & Co., Meriden, Conn., have a very attractive exhibit in the Acetylene Building. Included in the display is the Electrolite Acetylene Gas Table Lamp in many attractive finishes. They are also showing a large line of portables for commercial and acetylene gas. These portables are original designs and are made up in a variety of beautiful finishes.

Hay-Budden Mfg. Company.

Hay-Budden Mfg. Company, Brooklyn, N. Y., display 20 Hay-Budden Solid Wrought Anvils ranging from 25 to 530 pounds in weight, and including their regular Blacksmith, Farrier, Farrier Clip Horn, Double Horn, and Plow Maker patterns. The Blacksmith Anvils are in different proportions as regards width of face, length of horn, height, &c.—in all constituting a liberal assortment of various shapes and patterns.

Cleveland Stone Company.

The exhibit of the Cleveland Stone Company, Cleveland, Ohio, is located on the triangular space at the junction of the two aisles in the Mines Building. Where the aisles meet they have a pyramid of Grindstones 18 feet high, starting with a 7-foot base and lessening the size of each Stone in the pyramid until the last one is but a few inches in diameter. Back of this exhibit, and abutting the one next to them, they have erected stone masonry with a court, the stone work being on three sides of same and the wall being only about 4 feet high, with columns on the ends. Stone is selected from different quarries showing different mines.

Syracuse Chilled Plow Company.

The Syracuse Chilled Plow Company, Syracuse, N. Y., show a fine line of goods, including Two-Furrow Gang Plow, style H, Syracuse, Jr., Sulky Plow, Spring Tooth Lever Harrow, Spring Tooth Lever Smoothing Harrow, wood and iron beam Reversible Plow, flat land Plows, export Plows, Shovel Tooth and Spring Tooth Hand Cultivators. They also show their line of contractors' implements, including Wheel Scraper, Drag Scraper and No. 98 Contractors' Plow. Other goods shown are Store and Warehouse Trucks, Steel Tray Tubular General Purpose Barrow, Steel Tray Wood Frame Dirt Barrow and Garden Barrow. An attractive feature of the display is their Gold Plow, previously shown at the Columbian Exposition, 1893, and Paris Exposition, 1900.

Buck Brothers.

The exhibit of Buck Brothers, Millbury, Mass., is displayed in a plate glass case 6 x 3 feet, 7 feet high, the goods being arranged on six inclined shelves. They show a large line of Light Edge Tools and Razors, special attention being called to the handles and handling. There is a great variety of Chisels and Gouges, such as Tang, Firmer, Paring, Socket, Coach, Millwright, Framing, Mortise, Bent Shank, Deck, Corner and Turning; also Plane Irons, Countersinks, Reamers and a large line of Carving Tools. There is a large line of Beveled Edge Chisels, both Socket and Tang, with apple and rose-wood handles in plain and fancy style; also a series of Tools and Razors shown in the different stages of manufacture, illustrating the progress of the work from the bar of steel to the finished product.

Coates Clipper Mfg. Company.

The exhibit of Coates Clipper Mfg. Company, Worcester, Mass., covers about 175 square feet in the Machinery Building. They have a complete installation of sheep shearing machinery, horse grooming machinery and horse clipping outfits, as well as models of their flexible shafting capable of transmitting from $\frac{1}{2}$ to 12

horse-power. The clipping and grooming machinery is in full operation. One of the chief attractions of the exhibit is their latest Twentieth Century model Clipper. The handles of this Clipper are built on the same principle as a pair of pliers, working in a plane at right angles with the cutting plates. Being made in this way the Clipper may be used with equal facility in either the right or the left hand. Some 75 varieties of clipping machinery are on exhibition.

Cleveland Wire Spring Company.

An interesting exhibit of Metal Specialties is made in the Manufacturers' Building by the Cleveland Wire Spring Company, Cleveland, Ohio. On a large white background are grouped many different styles of Wire Springs, Sheet Steel Never Drip Mortar Hods, Standard Brick Hods, Hand Barrows, Hardware Nail Boxes and Shop Boxes. In the foreground is shown the construction of the different articles in various stages of manufacture. A novelty in Spring making is shown in a Coiled Compression Spring, 96 feet long, requiring 800 feet of wire in its construction. This company make a specialty of supplying Agricultural Implement and machine manufacturers generally with high grade oil tempered Steel Springs, which are also used for all varieties of work. Improved styles in metallic Spring Beds are also shown.

Lamb & Ritchie.

A novelty which has attracted considerable attention is exhibited in Section 25 of the Machinery Building by Lamb & Ritchie, Cambridgeport, Mass. It is tin lined or lead lined Wrought Iron Pipe, in which the lining is not only thick enough to constitute a substantial inner pipe, but is also inseparable from the iron. The inclosure of the section is attractively made of Pipe, and some 10-foot lengths are stacked up at the back, while others are suspended in such a manner as to allow electric light to show the polished surface of the tin lining. Samples are shown bent and coiled and there are sections of Pipe twisted to prove that the lining is inseparable from the Pipe. Neither bending nor hot water, it is stated, will cause the pipe and lining to separate; and this, we are advised, has been established beyond question by nearly two years of actual use under the most trying conditions.

Morse Twist Drill & Machine Company.

The exhibit of the Morse Twist Drill & Machine Company, New Bedford, Mass., at the Pan-American Exposition at Buffalo occupies space 43 in the Machinery Building and is displayed in three cases, representing every department in their factory. The cases contain Twist Drills of various sizes, and special attention is called to the large display of Oil Drills of their special pattern, with holes through the solid stock; Oil Sockets, Three-Groove Chucking Reamers, Chucks, various kinds of Formed Cutters and Milling Cutters, Straight and Taper Reamers, Mandrels with expanding sleeves, Gang Cutters, Cutters with radial grooves, Plug, Ring and Wire Gauges, Counterbores, Countersinks, Taper Pins, Screw Slotting Cutters, End Mills, Cutters with spiral teeth, Taps, Dies and Screw Plates. The largest Drill exhibited is 5 inches in diameter and the smallest Drill, No. 80, is 0.0135 inch in diameter.

Smith & Hemenway Company.

Smith & Hemenway Company and the Utica Drop Forge & Tool Company, 296 Broadway, New York, exhibit two cases of fine Nippers and Pliers. This display is shown as part of the collective exhibit of W. Jac Marland in Section S of the Electricity Building. The cases are attached to the wall and are filled with samples of the products fastened to the backs of the cases and arranged in attractive groups. The backs of the cases are lined with black velvet, which brings out the brightly polished steel surfaces of the tools. The manufactures include Nippers and Pliers for the use of linemen and others requiring heavy tools, as well as small and daintily finished tools for the use of jewelers and others who require delicate instruments. This exhibit also represents the products of the Ericsson Telephone

Company, 296 Broadway, New York. A 50-subscriber switchboard and a few of their different Telephones are shown.

Studebaker Bros. Mfg. Company.

The Studebaker Bros. Mfg. Company, South Bend, Ind., have a large number of exhibits. In the Machinery and Transportation Building they show fine Carriages, Passenger Wagons, Business Wagons and Harness. In the Stadium they display Farm Wagons and Carts. In the West Ordnance Building they show an Army Ambulance and an Army Escort Wagon. In the Government Building they exhibit a rural Mail Delivery Wagon. On the grounds the Studebaker Sprinkler is used exclusively. The fine Carriages shown comprise a Demi-break, extension front Brougham, half top Park Phaeton, Depot Wagon, single seat Trap, Top Buggy and Park Wagon. The Harness shown comprises all grades, from the moderate priced to the very finest Harness. Among the Farm Wagons shown is a special Wagon designed for South America. A very heavily ironed Mountain Wagon is exhibited, which is designed for the Pacific Coast and the mountains. The company also exhibit a phaeton front Delivery Wagon and a sample of their best type of Cart for contractors' use.

Iowa Farming Tool Company.

The exhibit of the Iowa Farming Tool Company, Fort Madison, Iowa, is located in the Stadium. A pyramid 20 feet high, 8 feet at base and 2 feet at top is employed, on which the company show samples of finished goods, as follows: Fifty-three kinds of Forks, consisting of Hay, Manure, Spading, Header, Barley, Fish, Diamond Tine and English Stable; 32 kinds of Hoes, Cut Easy, Garden, Corn, Crucible, Ladies', Boys', Toy, Riveted, Meadow, Rhode Island, Nursery, Mortar, Street, Sprouting, Mattock, Scuffle, Beet and others; 12 kinds of Rakes, Prize, Peerless, Level Head, Socket, Toy and Lawn; 7 kinds of Weeders, one, two, three, four, five and six tooth; 11 kinds of Hooks, Goose Neck and Bent Head Potato and Manure Hooks, also Jumbo Manure. They also display No. 4 Tool Set, No. 2 Sidewalk Cleaner, No. 10 Ice Chisel, Cut Easy Corn Hooks, Hold Easy Corn Knife, Wooden Stable Fork, as well as their patent Peerless and four other Snaths, and their patent Dutch Bow Prize Cradle. In addition to the pyramid they have a wall in the back of the exhibit on which they show unfinished goods from their forge shops.

Wilke Mfg. Company.

The Wilke Mfg. Company, Anderson, Ind., occupy a booth which is constructed on the same general lines as their tile Refrigerators with full nickel-plated trimmings. It consists of a solid wall 5 inches thick and 4 feet 6 inches high, with the corner irons, screws and washers of nickel plated brass. At each corner they have a post running to a height of 10 feet 6 inches, supporting a cornice of embossed tile. There are also intermediate posts on the two sides of the booth. In front of the booth is a doorway 3 feet 6 inches wide, on either side of which is a lintel supporting a nickel plated candelabra or a cluster of three incandescent lights. On each of the posts are several nickel plated brackets supporting incandescent lights, all of which have cut glass shades, thus making a very striking appearance when illuminated. Within the booth are displayed six of the company's regular stock models of Refrigerators, four all tile, and two full tile lined, paneled oak exterior, which gives a very good idea of the line of goods manufactured by them. One of the Refrigerators is kept iced all the time, so as to demonstrate to visitors the company's claims regarding low temperature and perfect circulation of cold dry air.

Northfield Knife Company.

The exhibit of the Northfield Knife Company, Northfield, Conn., in the Manufacturers' and Liberal Arts Building, consists of five showcases, one of which is a large showcase of oak with handsomely decorated cornice with the company's name, address and trade-mark UN-X-LD in gold, this case having two panels, each containing several hundred styles of Pocket Knives artistically arranged on a background of blue silk plush,

including nearly every conceivable shape and style, with many specimens of exquisite workmanship. The exhibit contains over 1000 styles of their UN-X-LD Pocket Knives with handles of pearl, tortoise shell, ivory, stag horn, aluminum (beautifully engraved), Siam buffalo horn, ebony, &c. In one of the other showcases many other styles are shown, with an outfit of the company's special display boxes for showcase use, while another showcase is devoted to an illustration of the making of Pocket Knives, showing the various stages in the process of manufacture, from the raw material to the finished goods, and also the various raw materials of pearl, tortoise shell, stag horn, ivory, ebony, &c., with the name of the country from which each is obtained. The showcases have a frontage on the aisle of 13 feet, and are about 10 feet in height.

Hazard Mfg. Company.

The Hazard Mfg. Company, Wilkes-Barre, Pa., manufacturers of Wire Rope and Insulated Wires, are located in Section F of the Electricity Building. Their exhibit consists of a booth with a platform 8 x 14 feet covered with a kiosk roof done in green and gold and supported by pillars entwined with tinned and copper strands, the platform being inclosed by a paneled rail made up of Wire Rope and brass mountings. The interior of the booth at the back contains a handsome oak sample board displaying longitudinal sections of Iron, Steel and Galvanized Wire Ropes, both round and flat, the whole trimmed with and mounted on brass. Among the various samples displayed are sections of the rigging furnished to the Herreshoff Company, Bristol, R. I., and used on "Constitution," built to defend the America's cup. This company has furnished rigging for the successful cup defenders for several years past. In a sample case at the front of the booth are shown cross sections in brass of the many varieties of Weather Proof, Lead Incased and Armored Cables manufactured. There are also small coils of Weather Proof and reels of Magnet Wire attractively arranged about the booth. We are advised that nearly, if not all, the Insulated Wire used by the police and telephone systems at the exposition was furnished by the company.

MERCHANT'S RED BOOK.

MERCHANT & CO. Philadelphia, have just issued what they term their Twentieth Century catalogue, consisting of 138 pages, illustrated by fine half-tone engravings and line drawings, showing the various departments of their works and the large line of goods which they manufacture or handle. Interspersed through the book are views illustrating the process of manufacture of Tin Plates, Solder, Babbitt and Newspaper Metals, also of the Star Ventilator department, and the International Sprinkler Company's factory, which is controlled and managed by the concern. Merchant's well-known brands of high grade Roofing Plates, which are manufactured exclusively at their own works, occupy several pages. Attention is also called to Merchant's continuous Roofing Tin in rolls, and to the large sized Terne Sheets made by the firm adapted for Car Roofing, Eave Troughs, Conductor Pipe and Cornice work. The company also make a line of high grade Bright Tin Plates and Bright Tin Sheets, which they offer in a number of sizes and gauges. Tables of standard sizes, gauges, sheets and net weights per box of Tin Plate and Taggers Tin and Black Taggers are presented, as well as tables to compute the price of any size of Tin Plates when basis price per box is given. A number of pages are devoted to Solders, Babbitt and Anti-Friction Metals and Newspaper Metals made by the firm at their smelting works. Merchant's Spanish Tiles, made of Sheet Metal, are given special prominence. Ridge Roof Tiles for siding and roofing follow, together with Star Ventilators made of galvanized iron, steel, copper or brass. Among other metal goods handled by the house to which attention is called are Sheet Copper, Copper Bottoms, Seamless Brass and Copper Tubes, Brass Tubing, Brass and Bronze in sheets and rolls, Brass and Copper Wire, Cold Rolled Cornice Copper, and Copper and Brass products of all kinds, Galvanized and Black

Sheets, Russia and Planished Sheet Iron, Wellsville Polished Sheets, Corrugated Roofing and Siding, Steel Roofing in large variety, Sheet Zinc, Lead Pipe and Sheet Lead, Eave Trough, Gutters, Gutter Hangers, Miters, Perfection Cut Offs, &c.

SAN FRANCISCO AND OAKLAND RETAIL HARDWARE DEALERS' ASSOCIATION.

THE following is a synopsis of an address delivered by A. C. Rulofson of Baker & Hamilton, San Francisco, at the last meeting of the San Francisco and Oakland Retail Hardware Dealers' Association. It will be noticed that the fact is emphasized that the understanding between the wholesale and retail trade of that territory is so satisfactory that the jobbers have discontinued their interference with the trade of the retail merchants, a practice which is referred to as quite common some years ago:

Mr. Rulofson's Address.

It is some 32 years since I entered the employ of the Russell & Erwin Mfg. Company's branch house at San Francisco. During all of these years I have had many experiences. I cannot call to mind a pleasanter one than that of this evening, in meeting for the first time the members of the Retail Hardware Dealers' Association of San Francisco and Oakland, but I cannot but feel a certain degree of sadness when I look over this assemblage and miss the familiar faces of those who have gone across the river, having laid aside the trials and tribulations attending the conduct of a retail Hardware business. I have fondly imagined that I knew intimately every retail Hardware merchant in San Francisco, basing this belief on my long experience in the trade. It is evident that I have overlooked the fact that a quarter of a century has hurried by and the reaper has been busy among my friends in the retail Hardware business, and as I glance about me I see now only a few—less than half a dozen—of those who were engaged in the Hardware business when I entered it, and they, like myself, were small boys, just entering their teens.

EARLY HISTORY.

It may be interesting to many of you younger men to have a short history of the Hardware business in San Francisco. In 1868 there were 12 or 15 large wholesale Hardware houses in this city; comparatively very few retail houses. The wholesalers were wholesalers in name only. They would sell you anything from a steam engine to a paper of Tacks, consequently there was no room for the small dealer. These large houses, however, were conducted very much on the "go as you please plan"—were not only engaged in the wholesale and retail Hardware business, but were also endeavoring with might and main to wipe each other out. While the profits were liberal and the condition of the country was prosperous and growing, these houses have all passed away, one after the other, and if you would take the names from the tombstones in the commercial graveyard you would find every wholesale Hardware concern established in this city has disappeared, with the exception of the firms of Conroy & O'Connor, now Dunham, Carrigan & Hayden Company; Huntington-Hopkins Company, known now as Miller, Sloss & Scott, and the firm of Baker & Hamilton, whose name has never been changed, and whom I have the pleasure of representing this evening.

Naturally you would ask what was the cause of the disaster that overcame all of these houses. I can say conscientiously that I believe that each of these houses thought that they could sell "just a little cheaper than the other fellow," and in carrying out that rule they lost sight of the expenses of doing business and before they were aware of it they were selling goods below what they cost them, hence when dull times came and shrinkage in values they had no accumulated profits, no reserve fund, no resources, and the result was inevitable—failure.

THE CHANGED POLICY OF TO-DAY.

I am glad that the wholesale dealers of the United States are doing business to-day under a different policy.

I am glad that the retail dealers have also come together to consult and abolish the abuses that have absorbed the profits of their business, and I wish to congratulate you, gentlemen, on coming together and forming an association that will undoubtedly be of great benefit to you not only in connection with your relations with each other, but your relations with the jobbers of this city and the manufacturers of the entire country. It is through your influence that the wholesale Hardware houses of San Francisco are strictly wholesale; that each one of these jobbing houses now becomes a supporter of the retail merchant rather than a competitor, and such relations must necessarily redound to the benefit of both classes.

Accept my assurance that the jobbers of this city wish your association every success and will gladly co-operate with you in the carrying out of any of your plans that are expedient and equitable.

J. STEVENS ARMS & TOOL COMPANY.

MACHINERY is being installed in the factory of the J. Stevens Arms & Tool Company, Chicopee Falls, Mass., for the manufacture of the Duryea Automobile. The company have secured the control of the construction of these machines, and will eventually devote all of the surplus space in their large factory to making the carriage. All of the machinery of the Hampden Automobile & Launch Company, of which Mr. Duryea was president and treasurer, has been moved from Springfield, and many new machines will be made and bought for the work. J. Frank Duryea, the inventor, will be in direct charge of the mechanical work. The castings are now on the floor for the first 50 of the machines, and a force of 25 men will be engaged immediately to perform the work. It is expected that this lot will be completed and ready for the market March 1, 1902. As the work progresses it is probable that the force of help will be increased, perhaps to 100 or more, and the quarters in which the carriages are made will be expanded. The machine which is to be made is referred to as having been thoroughly tested. It is a practical evolution of the carriage invented by Mr. Duryea in 1893, when he was considered to be one of the pioneers in the making of motor carriages in this country. The carriage as made by the Stevens Company will be known as the Stevens-Duryea carriage. The adoption of this business by the company is but following the pace which they have set during the last few years, losing no opportunity to expand the interests of the concern. The company now employ fully 900 men.

Fred. C. Ross of New York City has recently associated himself with the company to assist H. M. Pope in the manufacture of Rifles and Pistols. Mr. Ross is a skilled mechanic as well as an expert on Rifles.

THE BROWN FENCE & WIRE COMPANY.

THE BROWN FENCE & WIRE COMPANY, Cleveland, Ohio, have lately been organized with a capital of \$25,000, and the following officers: James Brown, president and manager; William Brown, vice-president; Andrew Brown, treasurer; Frank Spitz, secretary. Their office and works are located at Mason and Belden streets. They advise us that they are now ready to fill orders promptly for Wire Fence and Coiled Spring Wire, and state that they have a daily capacity of from 35 to 50 miles of Farm and Railway Fencing. A catalogue of 56 pages just issued illustrates the products of the company.

PAN-AMERICAN AWARDS.

F. E. MYERS & BRO., Pumps, Hay Tools, &c., Ashland, Ohio: Gold medal.

LANCASTER MACHINE & KNIFE WORKS, Machine Knives and Bit Braces, Lancaster, N. Y.: Gold and silver medals.

Jas. E. Carson of Fandon, Ill., has succeeded T. J. Bowman in the Hardware, Stove, Tinware, Agricultural Implement, Buggy and furniture business in Colchester, Ill.

WHAT TO DO IN NOVEMBER

BY H. C. W.

A WHOLE lot of good things for the winter months that you have not done in the years gone by. Make this fall and winter season the best one we have known in our business—we have everything to help us! Make changes that have never been made before, study to have them attractive and different from your neighbors.

There is a wonderful lot of Do and Don't possible for the good of the business in these last months of the year. They should be to us like the home stretch of the race track—in which the urging is done and best results made. More can be done in November and the month that follows to retrieve possibly bad months gone before than in any other three or four ordinary months.

It's a capital time to push and push hard for results. There is a feeling in common among many merchants that "the year is nearly done with, and but little more can be accomplished, do what we will." It's a great mistake if we will only realize it—the best of the race is always at the last.

Some Things to Do.

Get out what's left of last winter's stock—have it gone over thoroughly—see if it cannot be made as good as the new stock coming in.

Mix it in with this season's goods when ready, and let it get away and bring a profit with the balance, instead of piling it up as "carried over goods," and sacrificing two profits. Hunt up the mistakes of other seasons' buying, and correct them in the winter's purchases for this season.

Some seasons, in spite of all we can do, bring a certain amount of absolutely dead stock; it's a good time to give it away if no other method will move it.

Hunt up the put away cuts of other seasons and get ready for new advertising—and make it new. Decide on what novelty advertising you want to do, whether it be calendars, vest pocket memorandums or what not.

See if show window work cannot be lessened by adding a tile or other permanent floor to the windows by addition of Brackets, drop shelves, wall cases, &c. Have signs and price cards gotten ready in advance, that you may not lose their good when too busy to attend to it.

Try the New Man,

new at show window arrangement and new at advertising; see what surprises he has in store for you. He may have been with you for years, and all the time you have missed his good points, doing yourself in detail what he might have done, and to your great advantage. The man in the store who is not given a chance at this work by an employer is diffident as to the asking for it himself—more so than that he is not anxious for it.

An experience of some years has developed the fact that just such a reticent, quiet fellow nearly always shows up for a good window dresser or clever advertiser, if the way be thrown open to him. The writer calls to mind a young German of 18 or 19 years, never suspected for a moment by his employer as having talent for window arrangement, who, after a few weeks, was put in entire charge of such work and has been a prize winner in a number of such contests.

Another Good Man.

He is in nearly every store, and at this season of the year is extremely valuable. I refer to the young man who, without being constantly reminded of it, will pick out the rusty or soiled Pocket Knives, Razors, Scissors and Shears, and get them on a basis of "as good as new," bringing their full value. He will take the Machinists' Tools case and bring back many lost dollars out of it.

He sees that the Brass and Copper goods are brightened up and made salable, the rusty Fire Irons brought to a value. He gets the torn and soiled robes and blankets in such shape that at least there is no loss on them.

If he's good at this he's generally good at everything else in the store. He is worth developing and bringing

out, and at this particular season of the year is most valuable to the man who has him on his pay roll.

Your Winter Advertising

is more valuable, perhaps, than that of any other season of the year, and should be made a study. It's a good idea to ask for suggestions from every man at all capable you have in your employ. It's not bad to carry a vest pocket memorandum for jotting down ad ideas as they come to you—else they often get away forever.

Night work is not always desirable, but there is no question that to many of us our brightest squibs and best ideas come to us while sitting at home, and with other details of the business of the day lost sight of. Many men the writer knows do this class of work at night, and at home, because it is best when done there. The reading of the wonderful magazine work gives more and brighter ideas in ad work than we are willing to acknowledge. It is not necessary to copy them, but they are an education and teach much that may be a help.

The work of November should be exceptionally good, because on it, and the month that follows, depend largely your increased sales of holiday goods and novelties.

Read Your Trade Journal.

You have more time for this in the long nights of November than in many of the previous months, and much is to be gained from their careful going over. They are full of bright advertising ideas, as full indeed as any high class magazine.

There are articles and essays in many of them that are gems of information, both as to the trade and the outside world. The markets are as reliable as any to be secured elsewhere. They are full of the new things of the world, indeed the merchant who in these days neglects the trade journal is far behind just where he should be, and might be, far to the front. To men who take them and carefully study them it is a mystery, why, with the small investment necessary, every merchant in business should not provide himself with one or more.

November for Early Closing Hours.

It should begin them if they do not already exist, and in many towns of the West and Middle West the barbaric closing at 9 and 10 o'clock exists, and holds good all the year. The average day laborer has provided himself with an eight-hour day for his work. The machine shop, the foundry, the average dry goods house provides but eight hours. Yet hundreds of Hardwaremen in every State make slaves of themselves and their employees for 16 hours out of the 24.

It is due to the proprietor, and it is certainly due to those he employs that at least the evenings of the winter months be their own, to do as they will. No day laborer works any harder than the average Hardwareman, to no class should his evenings come nearer being due, for recreation, for reading, for the building up of the man. The State associations through local ones have been instrumental in bringing this about in a few towns in the States, at least for three or four months of the year. It should be universal, and early closing should hold for every month of the 12. More and better work is done, and this is an opportune time to take the matter in hand.

November a Good Month in Any Business.

A splendid one for collections—as a rule, all classes of people have money then, if at any time during the year. A good month to look forward and look backward, to know what you have done, and to see pretty well what you expect to do in the months to come.

As a rule, it is a prosperous month in nearly all lines, and it's largely what we make it, on through the month that follows to the first of the year.

Let's push it along, and push ourselves with it, for all the good things it has to give us.

G. E. Jenks has succeeded John Gee in the Hardware, Store and Sporting Goods business in Flaxton, N. D. A new store is in course of erection, and Mr. Jenks expects to add the sale of Farm Implements in the spring.

THE INDIANA MFG. COMPANY.

THE INDIANA MFG. COMPANY, manufacturers of Hollow Ware and other Castings, Jeffersonville, Ind., have recently completed a factory of 100 fires capacity for the manufacture of Chain, and are at present making Trace, Wagon, Breast, Log Chain and Chain Dogs. They expect to make all kinds of special Chain up to 1 inch. The plant is referred to as equipped with the latest approved machinery, and under the direction of experienced hands. The company are also putting on the market a line of Enamelled Pitcher Pumps, the manufacture of which was commenced about a year ago.

PRICE-LISTS, CIRCULARS, &c.

OSGOOD SCALE COMPANY, Binghamton, N. Y.: Under date of October 1 the company have issued a catalogue covering their line of Osgood United States Standard Scales. They call attention to a number of changes and improvements made since their catalogue of June, 1900, was issued. In their patent combination Wagon Scales, owing to numerous inquiries for varied sized platforms, they offer a complete list covering all sizes, from 7 x 13 to 12 x 22, in all capacities, from 3 to 15 tons. In their Iron Lever Scales they have added the 8 x 15 and 8 x 16 platforms to the 3, 4, 5 and 6 ton Scales, from 6 to 15 tons capacity. Their Portable Platform and Warehouse and Miners' and Transportation Scales are offered in entirely new patterns.

SHEBLE & KLEMM, Frankford, Philadelphia, Pa., for whom Peter McCartee, 79 Chambers street, New York has been the representative in this city for 40 years: Catalogue of 53 pages, No. 50, showing complete lines of Farm and Garden Tools. In addition to their regular lines of Forks, Hooks, Drags, Rakes, Weeders, &c., they have put on the market a comprehensive line of Hoes, which they are now manufacturing, to make their line more complete.

AUTOMOBILE & CYCLE PARTS COMPANY, Cleveland, Ohio: Folder illustrating the different factories of the company at Cleveland, Indianapolis, Elyria, Ohio; West-boro, Mass.; South Chicago, Ill.; Milwaukee and Chicago. The products include Balls, Pedals, Chains, Saddles, Tubing, Rims, Hubs, &c.

RICHARD ECCLES COMPANY, Auburn, N. Y.: Catalogue and price-list of Carriage Makers' Forged Irons. In addition to the complete line shown they are in a position to make many special Forgings to order.

MICHIGAN WHEELBARROW & TRUCK COMPANY, Saginaw, Mich.: One hundred and eight page catalogue, illustrating their line of Wheelbarrows, Warehouse Trucks, Hand Carts, Mining Cars, &c. Special attention is called to their New England Garden Barrow, which is packed K. D. flat. Each Wheelbarrow is complete by itself, except the wheel. The legs fold under in such a way that it is very easy to set the Barrow up, which is referred to as quite a consideration to the Hardware dealer when setting up Wheelbarrows in his busy season. There is no assorting of parts, and if reshipment is desired all he has to do is to tag the Wheelbarrow. If wished, the company will wire the wheel to the frame, making each Barrow complete.

TRAGLE MFG. COMPANY, Reading, Pa.: Price-list of Tragle brand of Horse Mouth Files and Floats of every description for veterinarians and horsemen, also File Cards, &c.

THE TORRENT PUMP & FENCE COMPANY, Cleveland, Ohio: Illustrated catalogue of the Torrent Purifying Pumps and the Rogers patent Fence Machine.

E. C. ATKINS & Co., Indianapolis, Ind.: Folder relative to their Pennsylvania Rex Crosscut Saw.

SYRACUSE WIRE WORKS, Syracuse, N. Y.: Circular illustrating Office Railing, Brass Hand and Foot Rails, Wire Partitions, Window Guards, Coal and Sand Screens, Flower Stands, Wire Mats, &c.

INDIANA MFG. COMPANY, Jeffersonville, Ind.: Card giving "A Simple Lesson in Color Blending," and calling attention to the company's products in the line of Hollow Ware.

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Pennsylvania Wholesale Hardware and Supply Association.

THE Pennsylvania Wholesale Hardware and Supply Association held its regular stated meeting in Philadelphia, Pa., on October 24. The meeting was held in the rooms of the Philadelphia Hardware Merchants' and Manufacturers' Association in the Bourse Building, and was called to order at 10 a.m. by the president, J. M. Kemmerer, Scranton, Pa. The following members responded to the roll call:

C. Morgan & Sons, Wilkes-Barre, B. F. Morgan.
 Phelps, Straw & Co., Wilkes-Barre, Geo. W. Lewis.
 Pennsylvania Supply Company, Wilkes-Barre, Wm. H. Cunningham.
 Bright & Co., Reading, Pottsville and Hazleton, G. H. Bright.
 John H. Obold, Reading, J. H. Reminger.
 Stichter Hardware Company, Reading, E. F. Feather and A. B. Stein.
 Bard, Schlott & Co., Reading, A. Raymond Bard.
 Bittenbender & Co., Scranton, J. M. Kemmerer.
 Foote, Shear & Co., Scranton, Frederick W. Shear.
 Chas. B. Scott, Scranton, Chas. B. Scott.
 Reilly Bros. & Raub, Lancaster, H. L. Raub.
 Steinman Hardware Company, Lancaster, H. S. Franklin and G. I. Franklin.
 Hazleton Supply & Mfg. Company, Hazleton, Wm. H. Taylor.
 Geo. Krause & Co., Lebanon, Geo. W. Krause.
 P. A. & S. Small, York, Phillip A. Small.
 C. Driesbach's Sons, Lewisburg, H. G. Driesbach.
 A. J. Root, Kingston, A. J. Root and H. Root.
 L. C. Thompson, Pottsville, L. C. Thompson.

The minutes of the previous meeting were read and approved. Wm. H. Taylor then moved that a committee be appointed to prepare suitable resolutions upon the death of the President of the United States, which motion was seconded and carried, the chairman appointing Messrs. Taylor, Morgan and Cunningham as the committee. The report of the Price Committee was then presented and read by Mr. Lewis, chairman, and on motion of Mr. Taylor was accepted, and after general discussion was ordered filed. H. G. Driesbach, Lewisburg, then presented and read the following paper, entitled

Difficulties in the Profitable Conduct of the Wholesale Hardware Business and Their Remedies.

Among the most potent causes of the comparatively unprofitable condition of the wholesale Hardware business, and which bring about more general demoralization of prices, is the spirit of antagonism and animosity, coupled with distrust and a more or less misunderstanding as to policy among jobbers. The spirit of the times would warrant this association in adopting the motto of the National Hardware Association—namely: "A Higher Standard of Business Methods." Heretofore jobbers, even though located widely apart, have regarded each other as arch enemies. The policy has been to try to destroy one another, one house claiming the right of existence for themselves only, and using all the measures at their command to destroy the competitor. In view of this fact it is not hard to discover why it is that so many houses have found the wholesale Hardware business comparatively unprofitable.

Manufacturers and the railroad companies awoke to the necessity of a change from the policy and abandoned the course some years ago. It was found there was room for all, and by coming together on a friendly basis, and using the community of interest policy, far more profitable and satisfactory results have been obtained.

Members, even in the short life of this association, have found their competitors were not such bad people as they had supposed, and that beneficial results from friendly relationship were entirely possible. If it were possible for the members of this association to maintain a profitable standard of prices on different commodities for the respective periods it would place all on a radically different plane from the one occupied without an organization. Through fear of the action of other jobbers the average profits on many lines of goods are undoubtedly smaller than they would be by concerted action of the members to maintain the standard of an as-

sociation. We have proof of this assertion in the experiences of associations already formed, and what is true of one association should prove true in all the various

links of the chain of associations now forming over the entire country. There is a marked contrast in the position of the jobbers of an association with an imbued spirit to obtain profitable prices on staples and seasonable goods as against the position of every jobber for himself, and each determined to meet the lowest prices reported, and not allow himself to be undersold on any line by any competition.

UNTRUE RUMORS.

Untrue rumors are undoubtedly the cause of many cut prices. Without thorough investigation these rumors grow and multiply until they result in the general weakening of prices. Strange, or rather not strange, to say, they are always on the side of low prices because it is a notorious fact that salesmen, as a class, are always on the bear side. It is rather an unusual experience for a house to have a salesman report that a rival house is selling a certain line of goods at a higher price and requesting permission to advance his selling price. The results of investigations of rumors by efficient secretaries have brought forth many surprises among jobbers.

LACK OF CONTROL OF SALESMEN.

Lack of control of salesmen is also responsible for many evils, chief of which is the lowering of prices and the causing of friction between rival houses. If the authority for fixing prices and deciding on the amount of profit a house should secure is vested in the salesmen, the results of the year's business, it is safe to assert, will be unsatisfactory to the stockholders or proprietors. The scheduling of prices is undoubtedly one of the duties of the management, and strict adherence to the same should be insisted upon by those responsible for the showing of the final report of the year's business. It is not my intention by the above statement to reflect in the least on the honesty of motive or the integrity of salesmen, but apparently by natural causes the results as outlined above, by a comparison of experiences, prove to be correct in the majority of cases where the above method has been tried.

IGNORANCE AS TO REAL EXPENSE OF JOBBING GOODS.

Ignorance as to the real expense of jobbing goods is another pitfall in the profitable conduct of the wholesale business. This is a subject which deserves the most careful consideration on the part of every house. It is a positive fact that merchants and salesmen, as a rule, are prone to underestimate the same. The items which enter into the expense account are pretty generally agreed upon at the present time. Some unusual surprises have developed by a comparison of the costs of doing business on the part of a group of jobbers, and the average has been found to be higher than was generally supposed. The remedy for the first difficulty mentioned by members of this association, we would suggest, is their regular attendance at the quarterly meetings. Acquaintance among jobbers makes correspondence and discussions possible. Without it one jobber hesitates to write another. It is not necessary to point out in detail the advantages of such attendance, for they are numerous and apparent.

Frequent correspondence by members of the association, either through the secretary or direct, is also another remedy which has been found effective in clearing up many misunderstandings and correcting wrong impressions. Many untrue rumors and reports of breaks in prices as well as wrong practices have been punctured and righted by this means.

DOCUMENTARY EVIDENCE.

Documentary evidence of cut prices by salesmen has been found to be the only true basis upon which action can be taken advisedly by those in charge. When such evidence is procured the proper course to pursue is to take up the subject with the offending party at once as we suggested above, either direct or through the secre-

tary, and if possible adjust the difficulty. The demand of documentary evidence will of itself tend to lessen the tendency of the salesmen to heed the assertions of unscrupulous buyers as well as the reports from various sources, and thus act as a check on the downward trend of prices.

SUGGESTIONS TO THE SECRETARY.

We would suggest that the secretary prepare blanks to be used by salesmen in reporting cut prices, and that a sufficient number be placed in the hands of each member for distribution among their salesmen. We submit the following as a sample of the blank:

REPORT BLANK.

Name of Customer,
Name of Competitor,
Article Involved,
Date,
Price.

To accompany the above blank we would suggest the following form of letter to be sent to each member by the secretary:

FORM OF LETTER.

MR. SALESMAN:

Our traveling force frequently report that prices below our established prices on certain lines are made by competitors. These complaints are frequently on order blanks, or in general letters, and sometimes do not receive the proper attention. We have had prepared blanks which we are sending you and request that you use same in making such reports. Please be careful to fill up all the items mentioned.

EXPENSE ITEMS.

Items composing expense are as follows:

Salaries of principals,	Stationery,
Salaries of employees,	Postage,
Traveling expenses,	Gifts to customers,
Rent,	Charity,
Insurance,	Bad accounts,
Taxes,	Discounts deducted by customers,
Repairs,	Collections and exchange,
Fuel, light and water,	Catalogues. (All who issue one.)
Case and cartage,	Miscellaneous expenses.
Telegraph and telephone,	
Advertising,	

Salesmen should have the fact constantly before them that the expense account is composed of two parts, one their own traveling expenses and salary, the other the inside expenses. If the exact ratio of expense is understood by both principals and salesmen, and an honest effort is made by concerted action to secure the maximum gross profit, the pernicious evil of meeting prices and the consequent demoralization will be lessened, and we will have started on the road toward a more profitable standard in the wholesale Hardware business.

A vote of thanks was tendered Mr. Driesbach for his able paper, which was ordered spread upon the minutes of the meeting and the secretary directed to send a copy of the paper to each member of the association.

Entertained at Luncheon.

A recess was then taken in order to meet the Philadelphia Hardware Merchants' and Manufacturers' Association at luncheon, after which a joint meeting of the two associations was held, and on calling the same to order a motion was made, seconded and passed "that the consideration of making a price card be postponed until the next meeting, with a recommendation that local price cards be established as far as possible."

The Committee on Resolutions Pertaining to the Death of the Late President of the United States then made the following report:

Whereas, Since our last meeting our country has sustained a great loss in the death of our late beloved President, William McKinley; therefore be it

Resolved, By the Pennsylvania Wholesale Hardware and Supply Association, in meeting assembled this 24th day of October, 1901, that they desire to express their sense of the great loss sustained not only by the country at large, but also by this association and each individual member thereof; and be it further

Resolved, That the above resolutions be spread upon the minutes of this association.

On motion the report of the committee was accepted, ordered spread upon the minutes and the committee discharged with thanks.

Open discussion on the management of the various Hardware interests followed. Papers were read by F. W. Huff of the Supplee Hardware Company and J. M. Ritter of the Biddle Hardware Company. Addresses were then made by T. James Fernley and a number of others, after which, on motion of Mr. Lewis, it was arranged that the next meeting of the association be held in Wilkes-Barre, Pa., on February 13, 1902, at which time and place the New York Hardware Association would hold their regular meeting, after which the meeting was adjourned.

The officers of the Pennsylvania Wholesale Hardware and Supply Association are as follows: President, J. W. Kemmerer, Scranton, Pa.; first vice-president, George Bard, Reading, Pa.; second vice-president, A. J. Roat, Kingston, Pa.; secretary and treasurer, H. L. Kaub, Lancaster, Pa.

The Executive Committee comprises George W. Lewis, Wilkes-Barre, Pa., chairman; A. B. Stein, Reading, Pa.; H. S. Franklin, Lancaster, Pa.; William A. Avery, Scranton, Pa., and L. C. Thompson, Pottsville, Pa.

All of these gentlemen were in attendance at the meeting.

Smoker.

On Thursday evening the visiting delegates were entertained by the Philadelphia Hardware Merchants' and Manufacturers' Association at a smoker held in the café of the Bourse Building, luncheon being served at 7.30 p.m. Besides the delegates of the Pennsylvania Wholesale Hardware and Supply Association, about 100 members and guests of the Philadelphia Association were present. After luncheon William Peters, vice-president of the Philadelphia Association, made an address of welcome to the visiting delegates, and introduced J. W. Kemmerer, president of the Pennsylvania Wholesale Hardware and Supply Association, who responded in a few well chosen words. Wm. H. Taylor of Hazleton also made an interesting address, after which an entertainment consisting of songs, humorous recitations and feats of legerdemain followed. Souvenir pipes of unique design were presented to those present, and after voting the smoker and entertainment a brilliant success the delegates and friends departed.

Friday's Excursion.

By previous arrangement the Philadelphia Hardware Merchants' and Manufacturers' Association entertained the visiting delegates on Friday, the 25th inst., by an excursion on the Delaware River and a visit to a number of different manufacturing plants. At 8 a.m. the delegates, invited guests and the Entertainment Committee of the Philadelphia Association, consisting of T. James Fernley, chairman; J. H. Van Newkirk, Russell & Erwin Mfg. Company; Edward S. Jackson, Miller Lock Company; C. Z. Tryon, E. K. Tryon & Sons, and F. W. Huff, Supplee Hardware Company, assembled at the Recreation Pier, foot of Race street, and embarked on the new city police and fire boat, "Samuel H. Ashbridge," proceeding up the Delaware River. The water front of Philadelphia was viewed with interest by the delegates, particularly the shipyards of Neale & Levy, and the Wm. Cramp Ship & Engine Building companies. The immense shipping facilities of the Philadelphia & Reading Railroad Company for coal and general freight at their Port Richmond wharves were also particularly noted.

After proceeding to a point above Riverton, N. J., the party returned to the wharf of Henry Disston & Sons, at Tacony, where under the guidance of Samuel Disston, H. C. Disston and George Koons they were escorted through all the various departments of the Saw and File making plant.

The plant of Fayette R. Plumb was then visited and inspected, after which the party proceeded to the works of the Miller Lock Company, where luncheon was served. From this point a train was taken to the plant of Thos. Devlin & Co., National Hardware & Malleable

Iron Works, which were carefully inspected under the direction of Thomas Devlin and others. The delegates then proceeded to the works of the Enterprise Mfg. Company, and to that of the G. & H. Barnett Company's Black Diamond File Works, which plants were also inspected with great interest.

The party then returned to the Manufacturers' Club, where an informal luncheon was served, Fayette R. Plumb presiding. Besides the delegates and their friends a number of prominent manufacturers met at luncheon, after which addresses were made by a number of the visiting delegation, the consensus of opinion being that trade which heretofore has been diverted to other points would in the future gravitate toward its natural destination—the city of Philadelphia.

Addresses were also made by W. W. Supplee, T. James Fernley, S. G. Hobson, London representative of *The Iron Age*; Thomas Hobson, manager of the Philadelphia office of *The Iron Age*; C. Z. Tryon, George Koons, and others.

A rising vote of thanks was then tendered to T. James Fernley, the Entertainment Committee and the Philadelphia Hardware Merchants' and Manufacturers' Association for the most excellent entertainment tendered to the Pennsylvania Wholesale Hardware and Supply Association.

AMONG THE HARDWARE TRADE.

D. R. Ball & Son have lately opened up in business in Juniata, Neb., handling at retail Shelf and Heavy Hardware, Stoves, Tinware and Sporting Goods.

H. H. Burling has purchased the Hardware, Stove and Farm Implement business formerly carried on by J. F. Reller in Cortland, Neb.

J. C. Bender has disposed of his Hardware, Stove and Harness business in Newport, Neb., to C. J. Reynolds, who continues at the old stand.

Smith & Strehl have bought the Hardware, Stove, Tinware, Farm Implement and Bicycle stock of John D. Bonton, Monroe, N. Y. They report business as excellent, especially in the shop, repairing roofs, putting in furnaces, stoves, &c.

W. A. Graham & Co. have succeeded Givens & Graham, Hardware and Agricultural Implement dealers, Wapello, Ill.

Des Moines Iron Company, Des Moines, Iowa, who opened up February 15 last and occupy a five-story building, 25 x 132 feet, besides a warehouse of two floors, 22 x 132 feet, report that business has developed to such an extent that they are now negotiating for the erection of a modern warehouse and lumber yards. The company are dealers in Iron and Steel, Heavy Hardware, Carriage Material, Wagon Wood Stock, Mine, Mill and Contractors' Supplies, &c.

U. S. Jarrett has purchased the Hardware business formerly conducted by L. A. Beckwith, St. Albans, W. Va.

S. G. Slack & Co., Tipton, Ga., have incorporated with a capital stock of \$10,000, and will carry on a wholesale and retail business in General Hardware, Farm Implements, Wagons and Wagon Material, Builders' Supplies, &c. They are now erecting a four-story brick block, 64 x 100 feet, on land owned by them. One-half of the new building will be occupied by the company's business.

Thos. A. Nichols, formerly a member of the firm of Nichols & Rankin, Stronghurst, Ill., has bought the Hardware, Stove, Tinware and Sporting Goods business of Frank Kupper, Burlington, Iowa, and will continue it under his own name. Mr. Nichols is making some improvements in the store and will enlarge the stock.

The McAndrew Hardware Company, Bentonville,

Ark., have been incorporated with a capital stock of \$6000. They will handle Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, &c., at retail.

The Loeb Carriage Company, Montgomery, Ala., have been extending the lines of their business, which now covers Carriage and Wagon Hardware, Blacksmiths' Tools, Blowers, Forges, Drills, Paints and Varnishes, besides a full line of Saddlery, Harness and Vehicles. They expect soon to issue a catalogue embracing Carriage and Wagon Hardware, &c.

E. Sedgwick has purchased the Hardware, Harness and Bicycle business of F. H. Patitz, Davenport, Neb.

Luttrell Hardware Company, wholesale and retail, Brewton, Ala., will shortly commence the erection of a new building, brick, 45 x 95 feet in dimensions, two stories high.

Murdock-Dunwiddle Company have succeeded Frederick Hardware Company in Beloit, Wis., dealers in Shelf and Heavy Hardware, Stoves and Tinware, Sporting Goods, &c.

Anderson & Warne are a new firm in Elburn, Ill. Their stock comprises Hardware, Stoves, Furnaces, furniture, &c.

Louis B. Smyser, general superintendent, and Frank S. Barnett, purchasing agent, of the United States Long Distance Automobile Company, Jersey City, N. J., have resigned their positions.

C. H. Smith has sold his Hardware business in Franklin, N. H., to J. E. Beck.

The Schroeder Rotary Washing Machine.

The rotary washer herewith shown is offered by the Benbow-Brammer Mfg. Company, St. Louis, Mo. The tub of the machine is made of red Louisiana cypress.



The Schroeder Rotary Washing Machine.

All iron parts coming in contact with the clothes are galvanized, while the castings are handsomely finished in colors. It is referred to as having a tight fitting lid, allowing no steam to escape; also as running forward or backward easily. The working parts are always in gear, it is remarked, and there is no sudden jar in reversing. There is an absence, it is stated, of clutches, springs, triggers or other devices which might break or get out of adjustment. The washer is made in several styles of tubs.

Ohio Tool Company.

Ohio Tool Company, Columbus, Ohio, have lately added to their list of manufactures a full line of iron bench screws, double thread, with wood handles and movable collars. These bench screws can also be supplied with iron handles at an additional cost. They have also made some additions to their line of adjustable iron and wood bottom bench and block planes, the additions being shown in a page for insertion in their catalogue.

The T. & B. Fruit Jar Wrench.

The accompanying cut represents a fruit jar wrench offered by the Tarbox & Bogart Mfg. Company, Cleveland, Ohio. The wrench is stamped from sheet steel to render it unbreakable. It will fit any Mason jar cover.



The T. & B. Fruit Jar Wrench.

By the use of the wrench jars can be made air tight, it is explained, and the most obstinate cover can be easily removed with it, without injuring the cover in any way.

The Phenix Hangers and Fasteners.

The Phenix Mfg. Company, Milwaukee, Wis., have recently made some changes in the construction of fasteners used in connection with their storm sash and window screen hangers. Fig. 1 shows the No. 1 hanger and

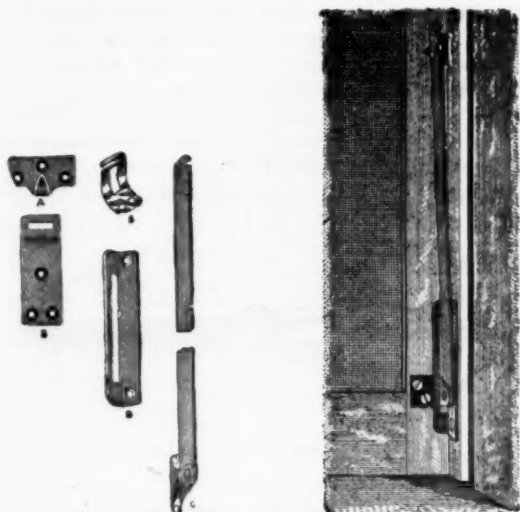


Fig. 1.—Hanger and Fastener No. 1. Fig. 2.—Application of No. 1 Hanger and Fastener.

fastener and Fig. 2 their application. The C part, or extension arm, is now constructed so as to do away with the right and left hand patterns, to make the applying



Fig. 3.—Hanger and Fastener No. 2.

of it simpler and more effective in every particular. The No. 2 fastener, illustrated in Fig. 3, is the company's original No. 4, with the exception that instead of using

a 2-inch screw, the eye part I, a strong casting, has been substituted, which is referred to as more substantial and

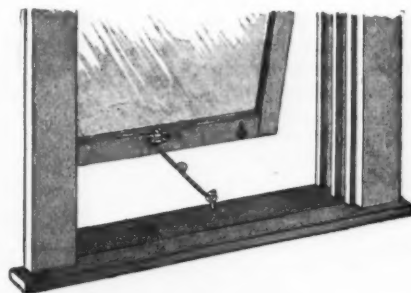


Fig. 4.—No. 2 Fastener Holding Sash Open.

effective. This No. 2 now takes the place of the former No. 2, which is no longer made. In Fig. 4 the storm

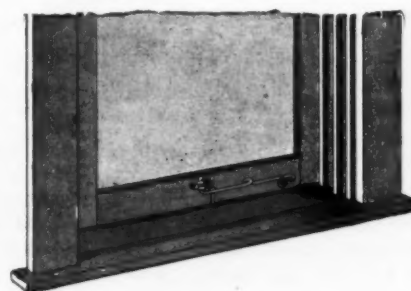


Fig. 5.—Sash Locked by No. 2 Fastener.

sash is shown adjusted for ventilation, and in Fig. 5 it is shown locked air tight.

The Boss Internal Gear Washing Machine.

The improved washing machine herewith illustrated is offered by the Boss Washing Machine Company, Cincinnati, Ohio. The improvements embodied are increased leverage, decrease in amount of power necessary to operate it, increased rapidity and no openings for escape of steam. All gearing is inside of the casing and out of sight. All castings, the fly wheel excepted, are heavily galvanized to prevent rust. It is stated that

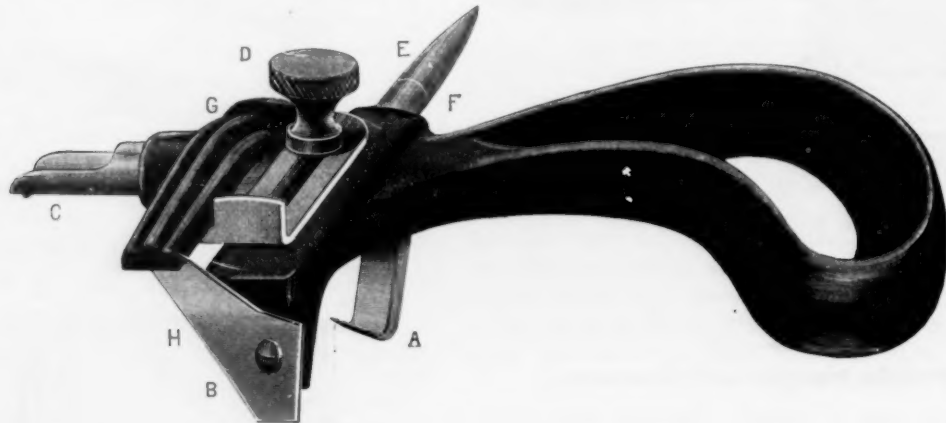


The Boss Internal Gear Washing Machine.

the castings cannot be broken by ordinary use, in handling or in shipping. All wooden parts are made of Louisiana red cypress, which, it is remarked, is impervious to water. The lower cylinder can be detached instantly from the connecting rod and removed from the machine, allowing the body of the machine after washing to receive thorough cleansing and ventilation. Every machine is set up complete at the factory, all that is necessary being to attach the fly wheel to the shaft. The makers claim that the machine does the work thoroughly, quickly and with little power, that a child can easily operate it and that it cannot tear the clothes. The machine is made in three sizes—No. 7, for family use; No. 8, for family use, extra large, and No. 9, for hotel and laundry use.

The Four in One Belt Tool.

The Buffalo Specialty Mfg. Company, Buffalo, N. Y., are offering the belt tool herewith shown. It includes a lace cutter, belt punch, belt cutter and lace awl. The uses to which the tool can be put are referred to as follows: Holes can be punched of almost any size, in any size or thickness of belting, without a hammer or block,



The Four in One Belt Tool.

by turning the tool, which is of great convenience on overhead belts. For cutting lace leather it is adjustable to cut any size string. The awl enables a belt to be unlaced quickly and easily. The tool is 5 inches in length; and weights 5½ ounces. Each one is packed separately in a neat paper box.

The Durant Counting Machines.

W. N. Durant, Milwaukee, Wis., has made an improvement in the dial of his counting machines. The new dial is constructed of celluloid, with a steel center. The center is permanently attached to the celluloid, which makes it practically indestructible. An illustration of the dial is herewith given which shows the exact size and the plainness of the figures. The counting machines made by Mr. Durant have met with much success from the time of their introduction, which has now been about 22 years. Mr. Durant's first order was received from the Edward P. Allis Company of Milwaukee, now the Allis-Chalmers Company, and was dated January



The Durant Counting Machines.

21, 1879. The firm gave Mr. Durant a testimonial in 1891, another in 1899 and another in September of this year, which speaks well for the way these counters wear. Mr. Durant has numbered every machine since he began the manufacture of counters, and has kept a systematic record of the date of sale, the purchaser, experiments as to improvements, &c. A memorandum is made if any repairs are required or improvements are added. By this system Mr. Durant has been able to eliminate any weak points which may be found without radically changing the counter. These counters received the highest award at the Chicago Exposition in 1893 and at the Pan-American Exposition now being held in Buffalo. Awards were also received at the Cincinnati

Exposition in 1880 and in Paris in 1900. Mr. Durant manufactures all kinds of counters and tally attachments for use in various lines of trade.

The Macon Adjustable Shears.

The Macon Shear Company, Macon, Mo., are putting on the market a line of shears, as shown in the

accompanying cuts, including all sizes of straight and bent trimmers. There is a little thumb screw on one side which works a lever on the opposite side, by the aid of which the shears are instantly adjusted to cut any material. It is remarked that there is no screw head to become worn with a screw driver. When loosened, it is explained, the shear cuts wet tissue paper or the finest gauze, or when tightened will cut tin cans or stove pipe; also that, being perfectly adjustable, there



Fig. 1.—The Macon Adjustable Shears.

is no undue wear upon the blades and that they will never wear out with ordinary usage. The seat or bearing is round, to give an even tension at every point, open or closed. A touch of the finger will take them apart for sharpening or cleaning. Their desirability for physicians' use is referred to, as they may be thoroughly sterilized. The shears are alluded to as not cramping the hand, but as working smoothly and as cutting clear to the tips. They do not spring and cut ragged in any material, it is claimed; also they cut soft, rough and strong goods or the most flimsy material cleanly and easily. The company have especially adapted this patent principle to barbers' shears, of which they make four



Fig. 2.—Reverse Side of Macon Shears.

sizes. A full line of shears and scissors are made in addition to the adjustable ones. They are manufactured of the best malleable iron castings, upon which is welded a facing of tool steel for the cutting edge. The shears are given a water temper, which, it is shown, is the severest possible test to detect cracks and flaws. They are then given a fine finish.

Current Hardware Prices.

REVISED OCTOBER 29, 1901.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33½@33½&10% signifies that the price of the goods in question ranges from 33½ per cent. discount to 33½ and 10 per cent. discount.

Cut Prices.—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 4, 1901), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, 7 doz. \$3.00.....33½@33½&10%
North's.....33½@33½&10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....25&5%
Taplin's Perfection.....30%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils.....7 7¼@7¾
Hay-Budden, Wrought.....9@9½
Horseshoe brand, Wrought.....9@9½
Arm and Hammer, Wrought.....9@9½

Imported—

Peter Wright's.....9¼@9½

Anvil, Vise and Drill—

Waters Falls Co., \$18.00.....20%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz.....25%
Smaller lots.....20%
Lots of 3 doz.....30%

Augers and Bits—

Com. Double Spur.....70@70&10%
Boring Machine Augers.....60@100@100@70&10%

Car Bits, 19-in. twist.....50@50&10%
Jennings' Pattern.....50@50&10%

Auger Bits.....50@10&5@60%
Ford's Auger and Car Bits.....40&10%
Foster's Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. tip, R. Jennings' list.....40%
No. 30, R. Jennings' list.....50%
Russell Jennings.....35&10&2%
L'Hommedieu Car Bits 5&10&15&10&2%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Smith's Auger Bits.....60%
Smith's Belt Hangers' Bits.....50&10%
Smith's Car Bits, 19-in. twist.....50&10%
Wright's Jennings Bits (R. Jennings' list).....50%

Bit Stock Drills—

Standard List.....65@65&5%

Expansive Bits—

Clark's small, \$18; large, \$26.....50&10%
Larigne's Clark's Pattern, No. 1, 7 doz., \$26; No. 2, \$18.....50&10%
C. E. Jennings & Co., Steer's Pat.....33½&10%
Wright's.....60%

Gimlet Bits—

Common Double Cut, gro. \$2.25@2.75
German Pattern.....gro. \$3.25@4.50

Hollow Augers—

Bonney Pattern, per doz. \$11.00@11.50
Aulick.....25&10%
New Patent.....25&10%
Universal.....30%
Wood's Universal.....25%

Ship Augers and Bits—

Steel.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15&10%
Watrous.....40%

Awl Hafts, See Hafts, Awl.

Awls—

Brad Awls:
Handled.....gro. \$2.75@3.10
Unhandle, Shouldered, gro. \$3@3.05
Unhandle, Patent.....gro. 66@70¢
Big Awls:
Unhandle, Patent.....gro. 31@34¢
Unhandle, Shouldered, gro. 65@70¢
Scratch Awls:
Handled, Common, gro. \$3.50@4.00
Handled, Socket, gro. \$11.50@12.00

Awl and Tool Sets—See

Sets, Awl and Tool.

Axes—

Best Quality, best brands, \$5.50@5.75
Best Quality, other brands, \$5.25@5.50
Jobbers' Special Brands:
Good Quality.....4.50@4.75
Best Quality.....\$5.00@5.25
Cheap, Handled Axes.....\$5.50@5.75
Unhandle, add 25c doz.

Axe Grease—See Grease, Axe.

Axles—

Concord, Loose Collar.....4½@5¢
Concord, Solid Collar.....4½@5¢
No. 1 Common.....3½@4¢
No. 1 ½ Com. New Style.....3½@4¢
No. 2 Solid Collar.....4½@5¢
Nos. 11 to 15.....70@70&10%
Nos. 15 to 18.....75@75&10%
Nos. 19 to 22.....75@75&10%

Boxes, Axle—

Common and Concord, not turned.....B. 4½@4½¢
Common and Concord, turned.....B. 4½@4½¢

Half Patent.....B. 4½@5¢

Balance Sash—

Caldwell new list.....50%
Pulman's.....60%

Spring—

Spring Balances.....60&10@50&10&5%

Chatillon's:
Light Soz. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....80%
Penny.....50%

Barb Wire—See Wire, Barb.

Bars—Crown—

Steel Ornate Bars, 10 to 40 lb., per lb. \$7¼@8¢

Beams, Scale—

Scale Beams, List Jan. 12, '92, 40&10%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters—Egg—

Standard Co.:
No. 5 Steel Handle Dover, 7 gro. \$6.50
No. 10 Cast Handle Dover, 7 gro. \$5.00
No. 10 Steel Handle Dover, 7 gro. \$5.00
No. 15 Extra Heavy Steel Handle, 7 gro. \$15.00
Rival, 7 gro. \$10.00
Taplin's Egg Co.:
No. 50 Small Family size.....\$6.50
No. 100 Regular Family size.....\$5.00
No. 102 Regular Family size, tinned.....\$9.50
No. 150 Large Family size.....\$15.00
No. 152 Large Family size, tinned.....\$17.00
Lyon's, Standard size.....\$17.00
Wander (S. S. & Co.).....\$7.50
Wonder (S. S. & Co.).....\$7.50

Bellows—

Blacksmith, Standard List, 70@70&10%
C. E. Jennings & Co., Blacksmith, 60&10%
C. E. Jennings & Co., Hand.....33½&10%

Blacksmiths—

Inch.....3 33 34 35 36 37 38
Each, \$3.50 3.75 4.25 4.80 5.35 6.15

Extra Length—

Each, \$4.00 4.55 5.10 5.60 6.10 7.50

Molders—

Inch.....9 10 11 12 13 14 15
Doz.....\$6.75 7.25 8.50 9.50 12.00 14.50

Hand—

Inch.....6 7 8 9 10 12
Doz.....\$3.75 4.25 4.50 5.00 5.7 6.75

Bells—Cow—

Ordinary goods.....75&5@75&10%
High grade.....70@70&10%
Jersey.....75&10%
Texas Stat.....50%

Door—

Abbe's Gong.....45%
Barton Gong.....55%
Home, R. & E. Mfg. Co.'s.....55&10%
Lover and Pull, Sargent's.....40&40&10%
Yankee Gong.....35%

Hand—

Hand Bells, Polished.....60&5@60&5%
White Metal.....65@55&10%
Nickel Plated.....30@5&10%
Swiss.....70@60&10%
Silver Chime.....33½@33½&10%

Miscellaneous—

Farm Bells.....10 2@24¢
Steel Alloy Church and School.....50&10&5@60%

National Bell Foundry Co.: Superior Cast Steel Church and School Bells.....50&10&5@60%

Wilmet & Hobbs Mfg. Co., Gongs.....70%

Belt—Rubber—

Agricultural (Low Grade), 75&10@80%
Common Standard.....75@75&10%
Standard.....70@70&10%
Extra.....60&10&5%
High Grade.....50&10@50&10&5%

Boston Belting Co.:
Seamless Stitched, Imperial.....45&5%
Boston.....50&5%
Niagara.....60&5%

Leather—

Extra Heavy, Short Lap.....50&10@60%

Regular Short Lap.....60@60&5%

Standard.....60&10@65&10%

Light Standard.....65@70%

Cotton—

Rosendale-Reddaway B. & H. Co.:
Sphinx Brand.....80&10%
Durable Brand.....70%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....40@50%

Bicycle Goods—

John S. Long's Son's 1899 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—
See Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—Tackle—

Common Wooden.....70&10@75%
Cleveland's teel.....80&10@70%
Ford's Star Brand Self Lubricating.....60&10%
Hollow Steel, Ford's Pat. Star Brand.....50&10%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50&10%
See also Machines, Hoisting.

Boards Stove—

Zinc, Crystal, &c.....40&10@..%

Boils—

Carriage, Machine &c.—
Common, list Jan. 3, '95, 65&2½@..%
Norway Iron, \$3.00, list Oct. 7, '96.....80@80&5%
Phila. Eagle, \$3.00 list May 2, '99.....80@80&10%

Bolt Ends, list Jan. 30, '95, 70&10@..%
Machine, list Oct. 1, '99, 70&2½@..%
Machine with C. & T. Nuts.....65&7½@..%

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:
Inch.....3 4 5 6 8
Per doz.....\$0.28 .30 .39 .47 .65

Cast Iron Spring Foot:
Inch.....6 8 10
Per doz.....\$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned:
Inch.....6 8 10
Per doz.....\$0.75 1.05 1.50

Cast Iron Shutter, Brass Knobs:
Inch.....6 8 10
Per doz.....\$0.67 .80 1.00

Wrought Barrel Brass Knob:
Inch.....3 4 5 6 8
Per doz.....\$0.44 .50 .61 .70 1.23

Wrought Barrel.....70&10@75&5%
Wrought.....Bronzed, 40&5@50&10%
Wrought Flush, B. K., 50&10@80&10%
Wrought Shutter.....40&10@100&5%
Wrought Square Neck.....50@50&10%
Wrought Sunk.....50@50&10%
Ives' Patent Door.....60%

Stove and Plow—

Plow.....60&5@..%
Stove.....77½%

Tire—

Common.....77½%
Norway Iron.....30@30&5%
American Screw Company:
Norway Phila., list Oct. 16, '94.....82½¢
Eagle Phila., list Oct. 16, '94.....85%
Bay State, list Dec. 28, '99.....77½¢
Franklin Moore Co.:
Norway Phila., list Oct. 16, '94, 83½¢
Eagle Phila., list Oct. 16, '94.....85%
Eclipse, list Dec. 28, '99.....77½¢
Port Chester Bolt & Nut Company:
Empire, list Dec. 28, '99.....77½¢
Keystone Phila., list Oct. '94.....85%
Norway Phila., list Oct. '94.....82½¢

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch.....1¼ 1½ 1¾ 2 2½ 3 3½ 4 4½ 5 5½ 6 6½ 7 7½ 8 8½ 9 9½ 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Per doz.....\$5.30 5.00 5.75 7.35

Inch.....1¼ 1½ 1¾ 2 2½ 3 3½ 4 4½ 5 5½ 6 6½ 7 7½ 8 8½ 9 9½ 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Per Doz.....\$3.65 11.50

Enterprise Mfg. Co., No. 1, \$1.35; No. 2, \$1.65; No. 3, \$2.50 each.....25%

Boring Machines—See Machines, Boring.

Boxes, Mitre—

C. E. Jennings & Co.....40%
Seavey's, per doz., \$30.....40%

Braces—

NOTE.—Most Braces are sold at net prices.

Common Ball, American.....\$1.15@1.15

Barber's.....50&10@50&10%
Fray's Genuine Spotted.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....60%
C. E. Jennings & Co.....50&10%
Mayhew's Ratchet.....50%
Mayhew's Quick Action Hay Patent.....50%
P. S. & W. Co. Peck's Patent.....60&10@65&5%

Brackets—

Wrought Steel.....75&5@75&10%
Bradley's Wire Shelf:
Full cases.....80%
Broken cases.....75&10%
Griffin's Pressed Steel.....75%
Griffin's Folding Brackets.....70&10%

Bright Wire Goods—See Wire and Wire Goods.

Broilers—

Wire Goods Co.....75%

Buckets, Well and Fire—

See Pails

Bucks, Saw—

Boss.....\$48.00
Hoosier.....\$30.00

Bull Rings—See Rings, Bull.

Butts—Brass—

Wrought list Sept., '96.....40@40&5%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....50@50&10%
Fast Joint, Narrow.....50@50&10%
Loose Joint.....70&5@70&10%
Loose Pin.....70&5@70&10%
Mayer's Hinges.....70&5@70&10%
Parliament Butts.....70&5@70&10%

Wrought Steel—

Table and Back Flaps.....60&10%
Narrow and Broad.....60&10%
Inside Blind.....60%
Loose Pin.....60%
Loose Pin, Ball and Steeple Tip.....70&10%
Japanned, Ball Tip Butts.....60%
Bronzed Wrt. Nar. and Inside Blind Butts.....45&20@45&25%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....55%
1200 series.....50%
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See Compasses.

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 5¼@4¢
Sharp, 1 prong.....per lb. 5¼@4¢
Perkins' Blunt Toe.....\$2 3¼¢
Perkins' Sharp Toe.....\$2 4¢

Can-Openers—See Openers, Can

Cans, Milk—

Illinois Pattern, \$1.75 2.10 2.25 each.
Iowa Pattern.....2.40 2.60 each.
Buffalo Pattern.....2.30 2.50 each.
New York Pat's, 2.50 3.25 3.40 each.
Baltimore Pat's, 2.50 2.85 3.10 each.

Cans, Oil—

Buffalo Family Oil Cans:
8 10 gal.
\$48.00 60.00 108 gro

Caps—Peruasion—

Eley's E. B.....60¢
G. D.....per M 33@34¢
F. L.....per M 37@40¢
G. E.....per M 47@50¢
Musket.....per M 57@60¢

Primers—

Berdan Primers, \$1.00.....5%
B. L. Caps (Sturtevant Shells) \$1.00.....5%
All other primers.....\$1.10@1.15

Cartridges—	
Blank Cartridges:	
38 C. F., \$5.00	10¢ to 10¢ 10%
38 C. F., \$7.00	10¢ to 10¢ 10%
38 cal. Rim., \$1.50	10¢ to 10¢ 10%
38 cal. Rim., \$2.75	10¢ to 10¢ 10%
B. B. Caps, Con., Ball Sngd., \$1.80	10¢ to 10¢ 10%
B. B. Caps, Round Ball, \$1.10	10¢ to 10¢ 10%
Central Fire	10¢ to 10¢ 10%
Pistol and Rifle	10¢ to 10¢ 10%
Primed Shells and Bullets	10¢ to 10¢ 10%
Rim Fire Sporting	10¢ to 10¢ 10%
Rim Fire, Military	10¢ to 10¢ 10%
Casters—	
Bed	70¢ to 70¢ 10%
Plate	75¢ to 75¢ 10%
Philadelphia	75¢ to 75¢ 10%
Boss	70¢ to 10%
Boss Anti-Friction	70¢ to 10%
Martin's Patent (Phoenix)	45¢
Payson's Anti-Friction	70¢ to 10%
Standard Ball Bearing	45¢
Tucker's Patent	30¢
Cattle Leaders—	
See Leaders, Cattle.	
Chain, Coll—	
NOTE.—The following prices are f. o. b. Pittsburgh. Manufacturers in quoting usually add freight to destination.	
American Coll, Cask lots:	
3-16	4-16 5-16 6-16 7-16 8-16 9-16
7.75	5.80 4.85 4.00 3.85 3.75 3.55
1/2	3/4 to 1 in. 1 1/2 to 1 3/4 inch.
3.55	8 1/2 per lb. 3.75 per 100 lb.
Less than Cask lots add 25¢.	
German Coll, list July 24, 79, 60¢ to 10¢ 10%	
Halters and Ties—	
Halter Chains	50¢ to 10%
German Halter Chain, list July 24, '97	60¢ to 10%
Cow Ties	60%
Trace, Wagon, &c.—	
Traces, Western Standard: 100 pair	
6 1/2—6 3/4, Straight, with ring	\$30.00
6 1/2—6 3/4, Straight, with ring	\$31.00
6 1/2—6 3/4, Straight, with ring	\$35.00
6 1/2—6 3/4, Straight, with ring	\$38.00
Add 2¢ per pair for Hooks.	
Tobacco Traces 1¢ per pair higher than Straight Link.	
Trace, Wagon and Fancy Chains	
50¢ to 10¢ 10%	
Miscellaneous—	
Jack Chain, list July 10, '93:	
Iron	60¢ to 60¢ 10%
Brass	60¢ to 60¢ 10%
Safety Chain	70¢ to 60¢ 10%
Gal. Pump Chain	1/2 lb. 4 1/4¢
Covert Mfg. Co.:	
Breast	35¢ 2 1/2
Halter	35¢ 2 1/2
Heel	35¢ 2 1/2
Heel	35¢ 2 1/2
Stallion	35¢ 2 1/2
Covert Snd. Works:	
Breast	70%
Halter	70%
Fold Back	70%
Rein.	70%
Onella C. Mfg. Co.:	
Am. Coll and Halters	50¢ to 10¢ 10%
Am. Cow Ties	50¢ to 10¢ 10%
Eureka Coll and Halters	60¢ to 10¢ 10%
Niagara Coll and Halters	60¢ to 10¢ 10%
Niagara Cow Ties	45¢ to 50¢ 10%
Wire Goods Co.:	
Dog Chain	60¢ to 10%
Universal Dbl-Jointed Chain	50%
Chalk—(From Jobbers.)	
Carpenters' Blue	gro. 12¢ to 15¢
Carpenters', Red	gro. 37¢ to 40¢
Carpenters', White	gro. 35¢ to 40¢
See also Crayons.	
Chalk Lines—See Lines.	
Checks, Door—	
Bardley's	40¢ to 10%
Columbia	60¢ to 10%
Eclipse	60¢ to 10%
Chests, Tool—	
American Tool Chest Co.:	
Youth's Chests, with Tools	55%
Gentlemen's Chests, with Tools	40%
Farmers', Carpenters', etc., Chests, with Tools	30%
Machinists' and Pipe Fitters' Chests, Empty	50%
C. E. Jennings & Co.'s Machinists' Tool Chests	30%
Chisels—	
Socket Framing and Firmer Standard List	
Buck Bros.	70¢ to 70¢ 10%
Charles Buck	80%
C. E. Jennings & Co. Socket Firmer No. 10	60¢ to 10%
C. E. Jennings & Co. Socket Framing No. 15	60¢ to 10%
Swan's	70¢ to 5%
L. & J. White	30¢ to 30¢ 5%
Tanged—	
Tanged Firmers	
40¢ to 40¢ 10%	
Back Bros.	
30%	
Charles Buck	
80%	
C. E. Jennings & Co. Nos. 191, 181	
25%	
L. & J. White, Tanged	
25¢ to 25%	
Cold—	
Cold Chisels, good quality, lb. 13¢ to 15¢	
Cold Chisels, fair quality, lb. 11¢ to 13¢	
Cold Chisels, ordinary, lb. 8¢ to 10¢	
Chucks	
Beach Pat. each \$8.00	
Massey's Planer and Milling	
15¢ to 20%	
Skinner Patent Chucks:	
Combination Lathe Chucks	
40%	
Drill Chucks, Patent and Standard	
2%	
Independent Lathe Chucks	
40%	
Improved Planer Chucks	
25%	
Universal Lathe Chucks	
40%	
Face Plate Jaws	
Standard Tool Co.	
Improved Drill Chuck	
45%	
Union Mfg. Co.:	
Combination	
40%	
Car Drill	
30%	
Geared Scroll	
30%	
Independent	
40%	
Union Drill	
30%	
Universal	
40%	
Face Plate Jaws	
35%	

Clamps—	
Adjustable, Hammers	20¢ to 20¢ 5%
Cabinet, Sargent's	50¢ to 10%
Carriage Makers', P. S. & W. Co.	40¢ to 10%
Carriage Makers' Sargent's	50¢ to 10%
Beavy, Parallel	33¢ to 10%
Lienman's, Ulica Drop Forge & Tool Co.	40%
Saw Clamps, see Vises, Saw Files.	
Cleaners Sidewalk—	
Star Socket, All Steel	40¢ net
Star Shank, All Steel	40¢ net
W. & C. Sargent, All Steel, 7 1/4 in. 4 doz.	\$3.05; 8 in., \$3.10; 8 1/2 in., \$3.25.
Cleavers, Butchers—	
Foster Bros.	30%
New Haven Edge Tool Co.	40%
Fayette R. Plumb	33¢ to 33¢ 10%
P. S. & W.	50¢ to 50¢ 10%
L. & J. White	25%
Clippers	
Chicago Flexible Shaft Company	40%
Handy Toilet	40¢ doz.
Mascotte Toilet	40¢ doz.
Monitor Toilet	40¢ doz.
Stewart's Patent	40¢ doz.
Clips Axle—	
Eagle and Superior 1/4 and 5-16 inch	70¢ to 10%
Norway, 1/4 and 5-16 inch	70¢ to 10%
Cloth and Netting, Wire—	
See Wire, &c.	
Cocks, Brass—	
Hardware list:	
Compression and Plain Bibbs, 55¢ 5%	
Globe, Kerosene, Racking, &c.	
Cocks	
65¢ to 10%	
Coffee Mills—See Mills, Coffee.	
Collars Dog—	
Brass, Pope & Stevens' list	40%
Embossed, Gilt, Pope & Stevens' list	40¢ to 10%
Leather, Pope & Stevens' list	40%
Compasses, Dividers, &c.—	
Ordinary Goods	70¢ to 10%
Bemis & Call Hdw. & Tool Co.:	
Dividers	65%
Callipers, Call's Patent Inside	55%
Callipers, Double	65%
Callipers, Inside or Outside	65%
Callipers, Wing	60%
Compasses	50%
J. Stevens & A. T. Co.	35¢ to 10%
Compressors Corn Shock—	
J. B. Hughes' 4 doz.	\$2.50
Conductor Pipe, Galva.—	
L. C. L. to Dealers:	
Territory. Not nested. Nested.	
Eastern	70¢ to 2 1/4%
Central	65¢ to 10%
Southern	65%
S. Western	60¢ to 12 1/4%
Terms: 25% for cash.	
Jobbers receive extra 12 1/4% to 25% on car loads, and extra 12 1/4% on car loads crated.	
See also Eave Troughs.	
Coolers, Water—	
Nos. 1 2 3 4 5 6	
Labrador	\$11.50 \$14.00 \$17.50 \$20.00
8 gal.	\$25.00
No. 1	3 4 5 6 8
Iceland	\$23.00 \$25.00 \$30.00 \$37.50
10 14 gal.	\$57.00 \$72.00
Coopers' Tools—	
See Tools, Coopers'.	
Cord—Sash—	
Braided, Drab	
1/2 lb. 25¢	
Braided, White, Common	
1/2 lb. 17¢ to 18¢	
Cable Laid Italian, lb. A, 18¢; B, 16¢	
Common India	
1/2 lb. 9¢ to 9 1/4¢	
Cotton Sash Cord, Twisted	
1/2 lb. 12¢ to 13¢	
Patent Russia	
1/2 lb. 12 1/4¢ to 13¢	
Cable Laid Russia	
1/2 lb. 13 1/4¢ to 14¢	
India Hemp, Braided	
1/2 lb. 14¢ to 15¢	
India Hemp, Twisted	
1/2 lb. 10¢ to 12¢	
Patent India, Twisted	
1/2 lb. 10¢ to 12¢	
Pearl Braided, cotton	
1/2 lb. 17¢ to 18¢	
Massachusetts, White	
1/2 lb. 22¢ to 24¢	
Eddystone Braided, cotton	
1/2 lb. 18¢	
Harmony Cable Laid Italian	
1/2 lb. 18¢	
Ossawa Mills:	
Crown, Solid Braided White	
1/2 lb. 22¢	
Braided, Giant, White	
1/2 lb. 20¢	
Feetless:	
Cable Laid Italian	
1/2 lb. 16¢	
Cable Laid Russian	
1/2 lb. 14¢	
Cable Laid India	
1/2 lb. 12¢	
Braided India	
1/2 lb. 12¢	
Phoenix, White	
1/2 lb. 19¢	
Brazed, Drab Cotton	
1/2 lb. 32¢ to 34¢	
Braided, Italian Hemp	
1/2 lb. 32¢ to 34¢	
Braided, Linen	
1/2 lb. 40¢	
Braided, White Cotton, Spot	
1/2 lb. 28¢ to 30¢	
No. 6 cords, 1¢ extra.	
Silver Lake	
A quality, Drab, 40¢	
15%	
A quality, White, 35¢	
15%	
B quality, Drab, 35¢	
15%	
B quality, White, 30¢	
15%	
Italian Hemp, 40¢	
15%	
Linen, 57¢	
15%	
Wire, Picture—	
Braided or Twisted	
85¢ to 85¢ 10%	
Note.—There is a good deal of confusion in list, some using old list and others the new list.	
Corn Knives and Cutters	
—See Knives, Corn.	
Corn Planters—	
See Planters, Corn.	
Crackers, Nut—	
Little Giant	40¢ gr. \$24.00
Cradles—	
Grain	50%
Crayons—	
White Round Crayons, gross 5 1/2¢ to 6¢	
Cases, 100 gro., \$5.50, at factory.	
D. M. Steward Mfg. Co.	
Metal Workers' Crayons, gr. \$2.50	
Soapstone Pencils, round, flat or square	
gr. \$1.50	
Rolling Mill Crayons	
gr. \$2.50	
Railroad Crayons (composition) gr. \$2.00	
See also Chalk.	
Creamery Pails—See Pails, Creamery.	
Crooks, Shepherds—	
Fort Madison, Heavy	40¢ doz. \$7.00
Fort Madison, Light	40¢ doz. \$6.50

Crow Bars—See Bars, Crow.	
Cultivators—	
Victor Garden	
1 doz. \$10.00	
Cutlery, Table—	
International Silver Company:	
No. 12 Medium Knives, 1841	
4 doz. \$3.50	
Star, Eagle, Rogers & Hamilton and	
Wm. Rogers & Son	
4 doz. \$3.00	
Simoon L. & Geo. H. Rogers Company:	
12 doz. Medium Knives	
4 doz. \$3.00	
No. 77 Medium Knives	
4 doz. \$2.50	
Cutters—Glass—	
H. H. Mayhew Co.	
40%	
Smith & Hemenway Co.	
50%	
Meat—	
Hale's, Nos. 11 & 11 1/2 & 11 3/4 & 11 1/2	
Per doz.	\$10.80 13 20 18.00
Anchor	30%
Nos. 1 2 3 4 5 6	
Each	\$5 7 10 \$25 \$50 \$60
Concealer	50%
No. 20	40 60 10 12
Each	1.25 2.00 2.25 3.00 8.00 4.00
Enterprise	25¢ to 25¢ 7 1/2%
Nos. 5 10 12 22 32	
Each	\$2 \$3 \$2.50 \$4 \$5
Dixon's 4 doz.	\$30 to 10%
Nos. 1	40%
Home No. 1	40%
Little Giant	40%
Nos. 305 310 312 390 325	
Sterling	\$24.00 \$48.00 \$44.00 \$72.00 \$68.00

Ladies—Melting—

L. & U. Mfg. Co.	25%
F. & W.	50%
Reading.	60%
Sargent's.	40% 40% 10%

Lanterns—Tubular—

Regular 100-lb.	dos. \$4.35 to \$4.75
Side Lift Tubular.	dos. \$4.75 to \$5.25
Square Lift Tubular.	dos. \$4.75 to \$5.25
Other styles.	dos. \$4.75 to \$5.25

Bull's Eye Police—

No. 1, 2 1/2 inch.	dos. \$5.00
No. 2, 3 inch.	dos. \$4.00
Boylan's Latches.	dos. \$5.00 to \$5.50

Lawn Mowers—

See Mowers, Lawn.	
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Leaders—Cattle—

Small.	dos. \$5.00; large, \$5.50
Covered Mfg. Co.	dos. \$5.50

Lemon Squeezers—

See Squeezers, Lemon.	
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Lifters, Transom—

Solid Grip, Payson Mfg. Co.	dos. \$5.00
R. & E.	dos. \$5.00

Lines—

Wire Clothes, Nos. 18	19	20
100 feet.	\$2.30	\$2.00
75 feet.	\$1.80	\$1.70

Ossaw Mills—

Crown Solid Braided Chalk.	dos. \$3.45
Mason's, No. 0 to No. 3.	dos. \$3.45
Samsom Cordage Works.	
Solid Braided Chalk, No. 0 to 3.	dos. \$4.00

Silver Lake Braided Chalk—

No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50	
W. G.	dos. \$8.00

Locks—Cabinet—

Cabinet Locks.	dos. \$5.00 to \$7.50
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Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]	
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Reading Hardware Co.—

R. & E. Mfg. Co.	dos. \$5.00
Sargent & Co.	dos. \$4.00 to \$10%

Elevators—

Stowell's.	dos. \$4.00
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Padlocks—

Wrought Iron.	dos. \$5.00 to \$5.50
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Sash, &c.—

Fitch's.	dos. \$5.00
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Iron—

Yves' Patent.	dos. \$5.00
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Wrought Steel—

Wrought Steel.	dos. \$5.00
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Payson's Signal—

Reading.	dos. \$5.00 to \$10%
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Machines—Boring—

Without Augers.	
Upright.	Angular.

Improved No. 3.	\$4.35	No. 1 \$5.00
Improved No. 4.	3.75	No. 2 \$3.38

Improved No. 5.	2.75	
Jennings.	2.50	3.00

Millers' Falls.	2.50	2.75
Snell's, Rice's Pat.	2.50	2.75

Swan's, No. 500.	6.10	No. 900 6.45
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Holisting—

Moore's Anti-Friction Differential Pulley Block.	dos. \$3.00
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Moore's Hand Hoist, with Lock Brake.	dos. \$3.00
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Moore's Portable Pneumatic Hoist.	dos. \$3.00
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Ice Cutting—

Chandler's.	dos. \$1.00
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Washing—

Wayne American.	dos. \$38.00
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Western Star, No. 3.	dos. \$28.00
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Western Star, No. 8.	dos. \$30.00
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St. Louis, No. 41.	dos. \$60.00
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Mallets—

Hickory.	dos. \$4.25 to \$5.00
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Lignum vitae.	dos. \$4.25 to \$5.00
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Tinners', Hickory and Applewood.	dos. \$4.25 to \$5.00
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Mats—Door—

Elastic Steel (W. G. Co.).	dos. \$1.00
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Mattresses—

See Mattresses and Mattresses.	
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Meat Cutters—

See Cutters, Meat.	
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Milk Cans—See Cans, Milk—

Enterprise Mfg. Co.	dos. \$25.00 to \$30%
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National, 1st Jan. 1, '94.	dos. \$30%
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Parker's Columbia and Victoria.	dos. \$30%
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Parker's Box and Side.	dos. \$5.00 to \$6.00
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Swift, Lane Bros.	dos. \$5.00 to \$6.00
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Mining Knives—

See Knives, Mining.	
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Molasses Gates—

See Gates, Molasses.	
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Money Drawers—

See Drawers, Money.	
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Mowers, Lawn—

Net prices are generally quoted.	
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Cheap.	all sizes, \$1.50 to \$1.95
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Good.	all sizes, \$2.35 to \$3.60
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High Grade 4.25	4.50	4.75	5.00
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Continental.	dos. \$6.00 to \$6.50
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Great American.	dos. \$7.00 to \$7.50
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Great American Ball Bearing.	dos. \$10.00 to \$10.50
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Quaker City.	dos. \$10.00 to \$10.50
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Pennsylvania Golf.	dos. \$10.00 to \$10.50
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Pennsylvania Horse.	dos. \$10.00 to \$10.50
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Pennsylvania Pony.	dos. \$10.00 to \$10.50
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Philadelphia.	dos. \$10.00 to \$10.50
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Style M. S. C. K. T.	dos. \$7.00 to \$7.50
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Style A. all Steel.	dos. \$6.00 to \$6.50
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Style F. Low Wheel.	dos. \$6.00 to \$6.50
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Style K. High Wheel.	dos. \$7.00 to \$7.50
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Drexel and Gold Coin, low list.	dos. \$6.00 to \$6.50
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Nails—	
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Out and Wire. See Trade Report.	
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Wire Nail and Brads, Papered.	
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List July 30, 1899.	dos. \$5.00 to \$5.50
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Hungarian, Finishing, Upholsterers', etc. See Trucks.	
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Horse—

Nos. 7 8 9 10	
A. C.	dos. \$25.00 to \$30.00

Ausable.	dos. \$25.00 to \$30.00
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Capwell.	dos. \$25.00 to \$30.00
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C. B. K.	dos. \$25.00 to \$30.00
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Champion.	dos. \$25.00 to \$30.00
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Clinton.	dos. \$25.00 to \$30.00
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Maud S.	dos. \$25.00 to \$30.00
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Neponset.	dos. \$25.00 to \$30.00
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Putnam.	dos. \$25.00 to \$30.00
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Vulcan.	dos. \$25.00 to \$30.00
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American, Nos. 5 to 10.	dos. \$25.00 to \$30.00
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Jobbers' special brands.	per lb. \$2.50
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Picture—

Brass Head.	dos. \$5.00 to \$5.50
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Por. Head.	dos. \$5.00 to \$5.50
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Nippers, See Filters and Nippers.**Nut Crackers—**

See Crackers, Nut.	
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Nuts—

Cold Punched.	Off list.
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Mfrs. or U. S. Standard.	
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Square, plain.	dos. \$5.00 to \$5.50
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Hexagon, plain.	dos. \$5.00 to \$5.50
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Square, C. T. & R.	dos. \$5.00 to \$5.50
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Hexagon, C. T. & R.	dos. \$5.00 to \$5.50
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Hot Pressed:—

Mfrs., U. S. or Nar. Gauge Stan'd.	
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Square Blank.	dos. \$5.00 to \$5.50
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Hexagon Blank.	dos. \$5.00 to \$5.50
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Square Tapped.	dos. \$5.00 to \$5.50
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Hexagon Tapped.	dos. \$5.00 to \$5.50
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Oakum—

Best or Government.	lb. 64c
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Navy.	lb. 5c
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U. S. Navy.	lb. 54c
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Plumbers' Spun Oakum.	lb. 54c
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In carload lots 1/4 lb. off f.o.b. New York.	
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Oil Axle—

Snow Flake.	
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1 pt. cans, per doz.	dos. \$5.00
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1 qt. cans, per doz.	dos. \$4.80
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1 gal. cans, per doz.	dos. \$15.00
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5 gal. cans, per doz.	dos. \$68.00
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Oil Tanks—See Tanks, Oil.**Oilers—**

Brass and Copper.	dos. \$4.00 to \$5.00
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Tin or Steel.	dos. \$4.00 to \$5.00
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Zinc.	dos. \$4.00 to \$5.00
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Paragon:—

Brass and Copper.	dos. \$4.00 to \$5.00
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Tin or Steel.	dos. \$4.00 to \$5.00
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Zinc.	dos. \$4.00 to \$5.00
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Malleable, Hammer's Improved, No. 1.	dos. \$5.00
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\$3.00; No. 2, \$4.00; No. 3, \$4.40	dos. \$5.00
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Malleable, Hammer's Old Pattern.	dos. \$5.00
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same list.	
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Wilcox & Hobbs Mfg. Co.	dos. \$5.00 to \$5.50
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Spring Bottom Cans.	dos. \$5.00 to \$5.50
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Railroad Oilers etc.	dos. \$5.00 to \$5.50
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Openers—Can—

French.	dos. \$5.00
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Iron Handle.	dos. \$5.00 to \$5.50
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Sprague, Iron Hdl.	per doz. \$5.00
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Sardine Scissors.	dos. \$1.75 to \$2.00
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Tip Top.	per doz. \$5.00
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National, \$ gro.	dos. \$1.75 to \$2.00
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Stowell's.	per doz. \$5.00 to \$5.50
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Walworth, \$ gro.	dos. \$5.00 to \$5.50
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Egg—

Nickel Plate.	per doz. \$2.25
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Silver Plate.	per doz. \$3.50
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Packing—

Asbestos Packing, Wick and Rope.	1 1/4 lb. 15c lb.
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Rubber—

Sheet, C. I.	dos. \$8.00
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Sheet, C. O. S.	dos. \$9.00
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Sheet, C. B. S.	dos. \$10.00
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Sheet, Pure Gum.	dos. \$10.00
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Sheet, Red.	dos. \$10.00
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Jenkins' Standard, \$ 50c.	dos. \$10.00
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Miscellaneous—

American Packing.	dos. \$7.00 to \$8.00
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Cotton Packing.	dos. \$10.00 to \$11.00
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Italian Packing.	dos. \$10.00 to \$11.00
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Jute.	dos. \$10.00 to \$11.00
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Russia Packing.	dos. \$10.00 to \$11.00
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Pails—Creamery—

S. & O. Co., with gauges.	No. 1 \$6.50;
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No. 2, \$4.75	dos. \$6.50
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Galvanized—

Acme.....1 1/2 in., 16; 2 in., 19 1/2
 Combsense, 1 1/2 in., 19 1/2; 2 in., 20 1/2
 Fox & Steel, Nos. 3 and 7, 2 1/2 in., 20 1/2
 No. 9, 1 1/2 in., 19 1/2; 2 in., 20 1/2
 Extra for Anti-Friction Bronze
 Bushing.....1 1/2 in., 19 1/2; 2 in., 20 1/2
 Grade Rapids All Steel Noiseless.....40 1/2
 Idea No. 13.....1 1/2 in., 19 1/2; 2 in., 20 1/2
 Niagara.....1 1/2 in., 19 1/2; 2 in., 20 1/2
 No. 24, Troy.....1 1/2 in., 19 1/2; 2 in., 20 1/2
 Star.....1 1/2 in., 19 1/2; 2 in., 20 1/2
 Tackle Blocks—See Blocks

Pumps—
 Cistern.....60 1/2
 Pitcher Spout.....75 1/2
 Wood.....50 1/2
 Pump Leathers, Lower and Plunger
 Valve—Per gro.....50 1/2
 Inch.....2 1/2 3 1/2 4 1/2 5 1/2
 \$2.30 2.50 2.75 3.00
 Inch.....3 1/2 4 1/2 5 1/2 6 1/2
 \$3.30 3.50 3.75 4.00

Barn—Dbl. Acting (low list).....50 1/2
 Flint & Walling's Fast Mail (low list).....50 1/2
 Flint & Walling's Pitcher Spout.....75 1/2
 Loud's Suction Pumps, U. S. Co.....20 1/2
 Meyer's Pumps, low list.....50 1/2
 Contractors' Rubber Diaphragm Non-
 checkable, B. & L. Block Co.....30 1/2

Punches—
 Revolving (4 tubes).....doz. \$3.75 to \$4.25
 Saddlers or Drive, good.....doz. 65 to 70 1/2
 Spring, single tube, good quality.....\$1.65 to \$1.75
 Bemis & Call Co.'s Cast Steel Drive.....50 1/2
 Bemis & Call Co.'s Check.....50 1/2
 Bemis & Call Co.'s Spring.....50 1/2
 Niagara Hollow Punches.....40 1/2
 Steel Screw, B. & L. Mfg. Co.....40 1/2
 Tanners' Hollow, P. S. & W. Co.....35 to 35 1/2
 Tanners' Solid, P. S. & W. Co., doz.....\$1.44

Rail—Barn Door, &c.—
 Cast Iron, Barn Door: Flange Screw
 Holes for R. D. Groove Wheels:
 1/2 3/4 1 in.
 \$1.70 \$2.10 \$3.00 100 feet.
 Angular for Sq. Groove Wheels:
 Small, Med. Large.
 \$1.60 1.75 2.70 100 feet.
 Sliding Door, Brazed Wrt Iron, 1/2 in., 1/2 in., 1/2 in.
 Sliding Door, Iron Painted.....2 1/2 to 3 1/2
 Sliding Door, Wrought Brass, 1 1/2 in., 1 1/2 in., 1 1/2 in.
 Crook's Double Braced Steel Rail, 1/2 in., 1/2 in., 1/2 in.
 Crook's O. N. T. Rail, 1 1/2 in., 1 1/2 in., 1 1/2 in.
 Crook's O. N. T., 100 ft., 1 in., 1 in., 1 in.
 Crook's Standard, 100 ft., 1 in., 1 in., 1 in.
 Crook's None Better.....ft. 3 1/2
 Crook's Standard.....ft. 3 1/2
 Crook's Cast Rail.....ft. 4
 Crook's Steel Rail, Plain.....25
 Crook's Wrought Bracket, Plain.....34 1/2

Rakes—
 Net Prices, Malleable Rakes:
 10 12 14 16 tooth
 Shank.....1.50 1.80 1.75 1.85
 Socket.....1.65 1.90 1.95 2.10
 Sept. 1, 1900, List:
 Cast Steel.....70 1/2 to 75 1/2
 Malleable.....70 1/2 to 75 1/2
 Lawn Rakes, Metal Head, per doz.....\$5.35 to \$5.75
 20 teeth.....\$5.35 to \$5.75
 Fort Madison Red Head Lawn.....\$3.25
 Fort Madison Blue Head Lawn.....\$3.00
 Jackson Lawn, 20 and 30 teeth.....\$4.00
 Kohler's:
 Lawn Queen, 20-tooth, 1/2 doz.....\$3.60
 Lawn Queen, 24-tooth, 1/2 doz.....\$3.75
 Paragon, 20-tooth, 1/2 doz.....\$2.55
 Paragon, 24-tooth, 1/2 doz.....\$2.60
 Steel Garden, 14-tooth, 1/2 doz.....\$3.00
 Malleable Garden, 14-tooth, 1/2 doz.....\$2.25

Raps, Horse—
 Diston's.....75 1/2
 Heller Bros.....70 1/2 to 75 1/2
 McCaffrey File Co. Horse Raps, 60 1/2 to 65 1/2
 New Nicholson Horse Rasp.....70 1/2 to 75 1/2
 See also Files

Razors—
 Boracle.....70 1/2
 Fox Razors, No. 42.....1/2 doz. \$20.00
 Fox Razors, No. 44.....1/2 doz. \$24.00
 Fox Razors, No. 52, Platina, 1/2 doz.....\$24.00
 Silberstein:
 Carbide Magnetic.....\$18.00
 Griffin, No. 65.....\$15.00
 Griffin, No. 60.....\$12.00
 All other Razors.....40 1/2
 Safety Razors.....40 1/2

Razor Straps—
 See Straps, Razor

Reels—Fishing—
 Beauty & Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Poplar and Salmon, Single Action, Multiplying and Quadruple, all sizes.....35 1/2
 Bendix Single Action Series, 102P and PN, 202P and PN, 102P and PN, 302P and PN, 502P and PN, 602P and PN, 802P and PN, 902P and PN, 102P and PN, 120P and PN, 140P and PN, 160P and PN, 180P and PN, 200P and PN, 220P and PN, 240P and PN, 260P and PN, 280P and PN, 300P and PN, 320P and PN, 340P and PN, 360P and PN, 380P and PN, 400P and PN, 420P and PN, 440P and PN, 460P and PN, 480P and PN, 500P and PN, 520P and PN, 540P and PN, 560P and PN, 580P and PN, 600P and PN, 620P and PN, 640P and PN, 660P and PN, 680P and PN, 700P and PN, 720P and PN, 740P and PN, 760P and PN, 780P and PN, 800P and PN, 820P and PN, 840P and PN, 860P and PN, 880P and PN, 900P and PN, 920P and PN, 940P and PN, 960P and PN, 980P and PN, 1000P and PN, 1020P and PN, 1040P and PN, 1060P and PN, 1080P and PN, 1100P and PN, 1120P and PN, 1140P and PN, 1160P and PN, 1180P and PN, 1200P and PN, 1220P and PN, 1240P and PN, 1260P and PN, 1280P and PN, 1300P and PN, 1320P and PN, 1340P and PN, 1360P and PN, 1380P and PN, 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Jobbers \$0.50@1.00, and Common, Plain Black Shovels generally sold by jobbers at about \$0.75.

Sieves and Sifters—
Hunter's Imitation, gro. \$11.00@11.50
Buffalo Metallic Blue, S. S. & Co., per gr. 14¢ 16¢ 18¢ 20¢
\$12.90 \$13.80 \$15.00
F. J. Meyers' Mfg. Co.,
Elliptical, per gr. \$11.00
Electric Light, per gr. \$11.00
Hunter's Genuine, per gr. \$12.50
No Name, Hunter's, per gr. \$11.00
Standard, per gr. \$11.00
Shaker (Barber's Pat.) Flour Sifters, per doz. \$2.00. 30¢

Sieves, Tin Rim—
Per dozen
Mesh, 14 16 18 20
Black, full size, \$0.95 .98 1.00 1.10
Plated, full size, \$1.05 1.08 1.10 1.20
Black, scant, \$0.78 .80 .83

Sieves, Wooden Rim—
Nested, 10, 11 and 12 inch.
Mesh 18, Nested, doz. \$0.65@0.75
Mesh 20, Nested, doz. .75@ .85
Mesh 24, Nested, doz. .90@1.00

Sinks—Cast Iron—
Standard list, 65¢ 10¢ 70¢ .
NOTE.—There is not entire uniformity in the used by jobbers.

Wrought Steel—
New Era, Galv'd and Enamelled, 70¢ 5¢
New Era, Painted, 60¢ 10¢
L. & G. Mfg. Co., Galvanized, 50¢
L. & G. Mfg. Co., Enamelled, 50¢

Sinks, Wagon—
Cast Iron, 70¢ 10¢ 75¢
Malleable Iron, 10¢ 10¢ 50¢
Steel, 40¢ 10¢ 105¢

Slates—
Factory Shipments.
"D" Slates, 50¢ 10¢ 10¢ 10¢
Unexcelled, etc., Noiseless Slates, 60¢
Victoria, etc., Noiseless Slates, 60¢
Wire Bound, 50¢ 10¢ 5¢
Web Hinge, 50¢

Slaw Cutters—See Cutters.
Slicers, Vegetable—
Sterling \$2.00. 30¢

Snaps, Harness—
German, 40¢ 10¢ 10¢
Covert Mfg. Co., 35¢ 2¢
Denny, 45¢ 2¢
High Grade, 45¢ 2¢
Jockey, 40¢ 2¢
Trojan, 45¢ 2¢
Yankee, 35¢ 2¢
Yankee, Roller, 30¢ 2¢

Covert's Saddlery Works:
Crown, 60¢
German, 60¢
Model, 60¢
Triumph, 60¢
W. & K. T. Fitch Co., 40¢ 10¢
Empire, 50¢ 5¢
German, 40¢
National, 50¢ 5¢
Perfect, 45¢
Clipper, 50¢ 5¢
Champion, 50¢ 5¢
Security, 40¢
Victor, 60¢ 5¢
Oneda Community, 85¢ 65¢ 10¢
Solid Steel, 85¢ 10¢ 65¢ 10¢
Sargent's Patent Guarded, 65¢ 10¢

Snaths—
Scythe, 55¢ 5¢ 5¢
Snips, Tinners—See Shears.
Soldering Irons—
See Irons, Soldering.
Spoke Trimmers—
See Trimmers, Spoke.
Spoons and Forks—
Silver Plated

Good Quality, 50¢ 10¢ 60¢ 10¢ 5¢
Cheap, 50¢ 10¢ 60¢ 10¢ 5¢
International Silver Co.,
1847 Rogers Bros. and Rogers & Hamilton,
Rogers & Bro., William Rogers Eagle Brand, 55¢ 10¢
Anchor, Rogers Brand, 60¢
Wm. Rogers & Son, 60¢ 10¢
Simeon L. & Geo. A. Rogers Co.,
Silver Plated Flat Ware, 60¢
No. 17 Silver Plated Ware, 60¢ 10¢

Miscellaneous—
German Silver, 60¢ 10¢ 60¢ 10¢ 10¢
Simeon L. & Geo. A. Rogers Co.,
German or Nickel Silver, Special list 1 & 10¢

Tinned Iron—
Teas, per gro. 65¢ 5¢
Tables, per gro. 90¢ 10¢ 1.00

Springs—Door—
Gem (Coll), 20¢
Star (Coll), 30¢
Terror's Rod, 39 in., per doz. \$1.10@1.25
Victor (Coll), 50¢ 10¢ 10¢

Carriage, Wagon, &c.
14 in. and wider:
Black or 1/4 Bright, lb., 50¢
Bright, lb., 50¢
Painted Seat Springs:
1 1/2 x 2 1/2 and smaller, per pr. 45¢ 18¢
1 1/2 x 2 1/2 and smaller, per pr. 50¢ 20¢
1 1/2 x 3 x 28 and narrower, per pr. 70¢ 25¢

Sprinklers, Lawn—
Enterprise, 25¢ 29¢
Philadelphia No. 1, per doz. \$12; No. 2, \$15; No. 3, \$24. 30¢

Squares—
Nickel plated, List Jan. 5, 1901
Steel and Iron, 70¢ 10¢ 75¢
Rosewood Hdl Try Square and T-Bevels, 60¢ 10¢ 70¢
Iron Hdl Try Square and T-Bevels, 10¢ 10¢ 10¢ 10¢
Dismont's Try Sq. and T-Bevels, 60¢ 10¢
Winterbottom's Try and Miter, 50¢ 10¢

Squeezers—Lemon—
Wood, Common, gro. No. 0, \$5.55
\$5.50; No. 1, \$5.25@5.50.
Wood, Porcelain Lined:
Cheap, doz. \$3.00@3.75
Good Grade, doz. \$3.00@3.50
Tinned Iron, doz. \$0.75@1.25
Iron, Porcelain Lined doz. \$2.90@5.55
Jennings' Star, per doz. \$1.85@1.90

Staples—
Barbed Blind, lb. 7¢ 74¢
Electricians', Association list, 80¢ 10¢ 10¢ 10¢
Fence Staples, same price as Barbed Wire. See Trade Report.
Poultry Netting, Staples, per lb. 35¢ 14¢
Grand Crossing Tack Co.'s list, 80¢ 10¢

Steels, Butchers—
Dick's, 30¢
Foster Bros', 30¢
Hartzell Cutlery Co., 30¢ 5¢
C. & A. Hoffmann's, 40¢
Steelyards—
25¢ 25¢ 10¢

Stocks and Dies—
Blacksmiths', 40¢ 10¢ 10¢
Gardner Die Stocks No. 1, 50¢
Gardner Die Stocks, larger sizes, 40¢
Green River, 25¢
Lighting Screw Plate, 25¢
Little Giant, 25¢
Reece's New Screw Plates, 25¢ 30¢
Curtis Reversible Ratchet Die Stock, 25¢

Stone—Soythe Stones—
Chicago Wheel & Mfg. Co.:
Gem Corundum, 1/2 inch, \$3.00 per gro., 12 inch, \$10.00.
Pike Mfg. Co. 1901 list:
Black Diamond S. S., per gro. \$12.00
Lamotte S. S., per gro. \$11.00
White Mountain S. S., per gro. \$9.00
Green Mountain S. S., per gro. \$6.00
Lily White Washita 4 to 8 in., 60¢
No. 1 Indian Pond S. S., per gro. \$7.50
No. 2 Indian Pond S. S., per gro. \$4.50
Leader Red End S. S., per gro. \$4.50
Balance of 1901 list 35¢ 45¢

Oil Stones, &c.
Chicago Wheel & Mfg. Co. 1901 list:
Gem Corundum Oil, Double Grit, 50¢
Gem Corundum Ax, Single or Double Grit, 50¢
Gem Corundum Sile, 50¢
Gem Corundum Razor House, 50¢
Pike Mfg. Co. 1901 list:
Arkansas Stone, No. 1, 3 to 5 in., \$2.50
Arkansas Stone, No. 1, 5 to 10 in., \$3.50
Arkansas Stone, No. 1, 10 to 15 in., \$4.00
Lily White Washita 4 to 8 in., 60¢
Royal Red Washita, 4 to 8 in., 50¢
Washita Stone, Extra, 4 to 8 in., 50¢
Washita Stone, No. 1, 4 to 8 in., 40¢
Washita Stone, No. 2, 4 to 8 in., 30¢
Lily White Slips, 90¢
Washita Slips, 90¢
Washita Slips, Extra, 70¢
Washita Slips, No. 1, 70¢

Hindustan No. 1, Regular, 50¢ 10¢
Hindustan No. 1, Small, 50¢ 10¢
Axe Stones (all kinds), 30¢
Turkey Oil Stones, ex. 5 to 10 in., 30¢
Queer Creek Stones, 4 to 8 in., 30¢
Queer Creek Slips, 10¢
Sand Stone, 50¢
Belgian, German and Swaty Razor Hones, 40¢
Natural Grit Carving Knife Hones, 40¢
Quick Edge Pocket Knife Hones, 40¢
Moused Kitchen Sand Stone, 10¢
Tanite Mills:
Emery Oil, per doz. \$5.00. 50¢ 50¢

Stoners—Cherry—
Enterprise, 25¢ 30¢
Stops, Bench—
Millers Falls, 15¢ 10¢
Morrill's, per doz. No. 1, \$10.00. 50¢ 20¢
Morrill's, No. 2, \$11.00. 50¢ 10¢
Stops, Window—
Ives' Patent, 25¢ 5¢
Stove Boards—
See Boards, Stove.
Stove Polish—See Polish, Stove.

Strainers, Pump—
Diamond Joe Pump Strainers, per doz. 75¢
Straps, Box—
Cary's Universal case lots, 20¢ 10¢
Stretchers, Carpet—
Cast Iron, Steel Points, doz. 55¢ 65¢
Socket, doz. \$1.75

Strops, Razor—
Smith & Heinenway Co., 70¢
Stuffers, Sausage—
Enterprise Mfg. Co., 25¢ 25¢ 74¢
National Specialty Mfg. Co., list Jan. 1, '97. 30¢

Tacks Brads, &c.—
List Jan. 15, '99.
Carpet Tacks, American 30¢ 25¢
American Cut Tacks, 50¢ 20¢
Sweeds Iron Tacks, 50¢ 30¢
Sweeds Upholsterers' Tacks, 50¢ 10¢
Gimp Tacks, 50¢ 10¢
Lace Tacks, 50¢ 10¢
Trimmers' Tacks, 50¢ 25¢
Looking Glass Tacks, 70¢ 10¢
Bill Posters and Railroad Tack, 90¢ 10¢
Hungarian Nails, 30¢ 15¢
Common and Patent Brads, 80¢ 10¢
Trunk and Clout Nails, 80¢ 5¢
Nails.—The above prices are for straight weights. An extra 5¢ is given Star Weights and an extra 10¢ is on Standard Weights.

Miscellaneous—
Double Point Tucks, 30¢ 6¢ or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list, 50¢ 10¢ 60¢
See also Nails, Wire.
Tanks, Oil—
Emerald, S. S. & Co., 30-gal. \$3.20
Emerald, S. S. & Co., 60-gal. \$4.00
Queen City S. S. & Co., 30-gal. \$3.50
Queen City S. S. & Co., 60-gal. \$4.35

Tapes, Measuring—
American Asses' Skin, 40¢ 10¢ 50¢
Patent Leather, 25¢ 30¢ 55¢
Steel, 10¢ 10¢ 55¢
Chesterman's, 25¢ 25¢ 55¢
Eddy's Steel, 40¢ 10¢ 55¢
Eddy's Metallic, 35¢ 10¢ 55¢
Keuffel & Esser Co. Steel and Metallic, 35¢
Lower list, 1899. 35¢
Lufkin's Steel, 30¢ 30¢ 55¢
Lufkin's Metallic, 30¢ 30¢ 55¢

Teeth Harrow—
Steel Harrow Teeth, plain or headed, base per lb. 24¢

Thermometers—
Tin Case, 80¢ 10¢ 90¢ 10¢ 5¢

Ties, Bale—Steel.
Standard Wire, 50¢ 10¢ 55¢

Ties, Wall—
Cleveland Wire Spinning Co.:
Galv. St. 5-32 x 8 1/4 in. \$1000. \$10.00
Galv. Steel 5-32 x 8 1/4 in. \$1000. \$11.00
Galv. Steel 5-32 x 1 1/4 in. \$1000. \$12.00
Galv. Steel 5-32 x 1 1/2 in. \$1000. \$14.00

Tinners' Shears, &c.—
See Shears, Tinners', &c.

Tinware—
Stamped, Japanned and Placed, sold very generally at net prices.

Tire Benders, Upsetters, &c.—
See Benders and Upsetters, Tire.

Tobacco Cutters—
See Cutters, Tobacco.

Tools—Coopers'—
L. & I. J. White, 20¢ 30¢ 55¢

Saw—
Atkins' Cross Cut Saw Tools, 40¢
Simonds' Improved, 39¢ 45¢
Simonds' Crescent, 25¢

Ship—
L. & I. J. White, 25¢

Transom Lifters—
See Lifters, Transom.

Traps—Fly—
Bullock, Globe or Acme, doz. \$1.15@1.25; gro. \$10.50@11.00
Harper, Champion or Paragon, doz. \$1.25@1.40; gro. \$12.00@13.50

Game—
Oneida Pattern, 75¢ 10¢ 5¢ 80¢ 5¢
Newhouse, 45¢ 45¢ 55¢
Hawley & Norton, 65¢ 25¢ 10¢
Victor (Oneida Pattern), 75¢ 75¢ 55¢
Star (Blake Pattern), 65¢ 10¢ 70¢ 55¢

Mouse and Rat—
Mouse, Wood, Choker, doz. holes, 8 1/2¢ 9¢
Mouse, Round or Square Wire, doz. \$0.85@1.00

American Pattern French Rat and Mouse Traps:
No. 1, Detroit Martv Pattern, per doz. \$4.50; in 1/4 gro. lots, per doz. \$4.00
No. 2, Detroit Martv Pattern, per doz. \$4.50; in 1/4 gro. lots, per doz. \$4.00
Detroit Martv Pattern Mouse, per doz. \$2.00; in 1/4 gro. lots, per doz. \$1.75
Diamond Joe Rat Traps, per doz. \$1.00
Martv French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each \$1.12 1/2; per doz. \$12.00
No. 3, Rat, per doz. \$6.00; case of 50 \$5.25 doz.
No. 3 1/2, Rat, per doz. \$4.75; case of 72 \$4.25 doz.
No. 4, Mouse, per doz. \$3.50; case of 72 \$2.75 doz.
No. 5, Mouse, per doz. \$2.75; case of 150 \$2.25

Schuyler's Rat Killer, No. 1, per gr. \$30.00; No. 2, per gr. \$30.00; Mouse, No. 2, \$18.00. 50¢

Target—
Markle's, each, \$5.50

Trimmers, Spoke—
Bonney's Nos. 1 and 2, 40¢

Trowels—
Dixton Brick and Pointing, 30¢
Dixton Plastering, 25¢
Dixton "Standard Brand" and Garden Trowels, 40¢
Never-Break Steel Garden Trowels, gro. \$7.00
Peace's Plastering, 30¢
Rose Brick and Plastering, 25¢ 45¢
Woodrough & McParlin, Plastering, 25¢

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, 50¢
Daisy Stove Trucks, improved pattern, per doz. \$18.50
Model Stove Trucks, per doz. \$18.50

Tubs, Wash—
No. 1 3 3 3
Galvanized, per doz. \$5.00 5.50 6.00
Galvanized Wash Tubs (S. S. & Co.), No. 1 3 3 3 10 20 30
Per doz. \$5.25 6.00 6.75 6.50 7.25 8.00

Twine—
Miscellaneous— BC B.
No. 9, 14 and 1/4-lb. Balls, 20¢ 24¢
No. 12, 14 and 1/4-lb. Balls, 18¢ 20¢
No. 18, 14 and 1/4-lb. Balls, 16¢ 18¢
No. 24, 14 and 1/4-lb. Balls, 15 1/4¢ 17 1/4¢
No. 36, 14 and 1/4-lb. Balls, 15¢ 17¢

Chalk Line, Cotton, 1/4-lb. Balls, 25¢ 10¢ 40¢
Cotton Mops, 6, 9, 12 and 15 lb., 10¢ 10¢ 10¢
Cotton Wrapping, 5 Balls to lb., according to quality, 10¢ 4¢ 7¢
American 3-Ply Hemp, 1/4 and 1/2-lb. Balls, 12¢ 15¢
American 3 Ply Hemp, 1-lb. Balls, 12¢ 15¢

India 2-Ply Hemp, 1/4 and 1/2-lb. Balls (Spring Twine), 34¢
India 3-Ply Hemp, 1-lb. Balls, 34¢
India 3-Ply Hemp, 1 1/4-lb. Balls, 7¢
2, 3, 4 and 5-Ply Jute, 1/4-lb. Balls, 9¢ 10¢
Mason Line, Linen, 1/4-lb. Balls, 15¢
No. 26 Mattress, 1/4 and 1/2-lb. Balls, 37¢
Wool, 3 to 6 ply, 34¢

Vises—
Solid Box, 50¢ 50¢ 105¢

Parallel—
Athol Machine Co.,
Simpson's Adjustable, 40¢
Standard, 40¢
Amateur, 25¢
Bonney's, 40¢
Fisher & Norris Double Screw, 15¢ 10¢
Holland's, 40¢

Mechanists—
40¢
Keystone, 40¢
Lewis Tool Co., 20¢ 30¢
Massey's Perfect, 15¢ 20¢
Massey's, 40¢
Hitcher, 30¢ 40¢
Combination, Quick Adj., 40¢
Woodworker's, 15¢ 20¢
Merrill's, 20¢
Miller's Falls, 50¢ 10¢ 105¢
Parker's, 20¢ 25¢
Regulars, 20¢ 25¢
Vulcan's, 40¢ 45¢
Combination Pipe, 25¢ 30¢
Prentiss, 20¢ 25¢
Sargent's, 40¢
Snediker's X. L., 20¢ 25¢
Stephens', 20¢ 25¢
Columbian Hdw. Co., 60¢

Saw Filers—
Bonney's No. 1, \$13; No. 3, \$16. 50¢
Dixton's D S Clamp and Guide, per doz. \$30. 25¢
Reading, 60¢
Westworth's Rubber Jaw, Nos. 1, 2 and 3, 45¢ 50¢

Miscellaneous—
Bignall & Keeler Combination Pipe Vise, 50¢
Parker's Combination Pipe: 87 Series, 60¢
187 Series, 60¢ 45¢
No. 870, 40¢

Wads—Price Per M.
B. E., 11 up, 60¢
B. E., 9 and 10, 70¢
B. E., 8, 80¢
B. E., 7, 80¢
F. E., 11 up, \$1.00
F. E., 9 and 10, 1.25
F. E., 8, 1.50
F. E., 7, 1.50
Ely's B. E., 11 and larger, \$1.70@1.75
Ely's F. E., 11 to 20, \$3.00@3.25

Wagon Jacks—
See Jacks, Wagon.

Ware, Hollow—
Aluminum, S. S. & Co. Reduced List, 40¢

Cast Iron, Hollow—
Stove Hollow Ware:
Ground, 60¢
Unground, 70¢
White Enamelled Ware:
Mastin Kettles, 75¢ 16¢ 5¢ 80¢
Covered Ware:
Tinned and Turned, 40¢ 10¢ 10¢ 10¢ 55¢
Enamelled and Plain, 50¢ 50¢ 10¢ 55¢
See also Pots, Glue.

Enamelled—
Agate Nickel Steel Ware, list July '99, 33 1/2¢ 10¢
L. & G. Onal Enamelled Ware, 65¢
Iron Clad Ware, 20¢ 10¢
Never Break Enamelled, 50¢ 5¢ 50¢ 10¢

Tea Kettles—
Galvanized Tea Kettles:
Inch, 6 7 8 9
Each, 45¢ 50¢ 55¢ 65¢

Steel Hollow Ware.
Avery Spiders & Griddles, 65¢ 55¢ 55¢
Avery Kettles, 60¢
Porcelain, 60¢ 55¢ 55¢ 105¢
Never Break Spiders and Griddles, 65¢ 55¢

Never Break Kettles, 60¢
Solid Steel Spiders & Griddles, 65¢ 55¢
Solid Steel Kettles, 60¢
Solid Steel Ware, Enamelled, 50¢ 55¢

Washboards—
Solid Zinc, per doz.
Crescent, family size, bent frame, \$3.00
Red Star, family size, stationary protector, \$3.00

Double Zinc Surface:
Baginaw Globe, family size, stationary protector, \$2.45
Cable Cross, family size, stationary protector, \$2.90

Single Zinc Surface:
Baled, family size, open back perforated, \$3.40
Baginaw, globe, protector, family size, ventilated back, \$2.25

Brass Surface:	
Brass King, Single Surface, open	back.....\$3.00
Nickel Plate Surface:	
No. 1001 Nickel Plate, Single Surface\$3.00
Washers—	
Leather, Axle—	
Solid.....	85¢ 10¢ 10¢ 85¢ 10¢ 10¢ 10¢
Patent.....	85¢ 10¢ 10¢ 85¢ 10¢ 10¢ 10¢
Oil:	1 1 1 1 1 1 1
100 110 120 130 per 100	
Iron or Steel—	
Size bolt.....	5-16 3/4 1/2 3/4 1/2 3/4
Washers.....	\$5.10 4.50 2.90 2.70 2.50
In lots less than one keg add 1/4¢ per	lb., 5-lb. boxes add 1/4¢ to list.
Cast Washers—	
Over 1/4 inch, barrel lots, per lb.....	1 1/4¢ 1 3/4¢
Washer Cutters—	
See Cutters, Washer.	
Washing Machines—	
See Machines, Washing.	
Water Coolers—	
See Coolers, Water.	
Wedges—	
Oil Finish.....	lb. \$2.90 @ \$2.10¢
Weights, Sash—	
Per ton, f.o.b. factory.....	\$19.00 @ \$22.50

Some Foundries make price \$1 @ \$2	lower.
Well Buckets, Galvanized	
See Pails, Galvanized.	
Wheels Well—	
8-in., \$1.50 @ 1.75; 10-in., \$1.80 @ 2.10;	12-in., \$2.35 @ 2.75; 14-in., \$3.75 @ 4.65
Wire and Wire Goods—	
Bright and Annealed:	
6 to 9.....	72 1/2¢ @ 75 1/2¢ 72 1/2¢ @ 105
10 to 18.....	72 1/2¢ @ 75 1/2¢ 72 1/2¢ @ 105
19 to 26.....	75¢ @ 77 1/2¢ 75¢ @ 105
27 to 36.....	75¢ @ 77 1/2¢ 75¢ @ 105
Galvanized:	
6 to 18.....	70¢ @ 70¢ 70¢ @ 105
19 to 26.....	72 1/2¢ @ 75 1/2¢ 72 1/2¢ @ 105
27 to 36.....	72 1/2¢ @ 75 1/2¢ 72 1/2¢ @ 105
Coppered:	
6 to 9.....	70¢ @ 70¢ 70¢ @ 105
10 to 18.....	70¢ @ 70¢ 70¢ @ 105
19 to 26.....	75¢ @ 77 1/2¢ 75¢ @ 105
27 to 36.....	75¢ @ 77 1/2¢ 75¢ @ 105
Tinned:	
6 to 14.....	75¢ @ 75¢ 75¢ @ 105
15 to 18.....	72 1/2¢ @ 75 1/2¢ 72 1/2¢ @ 105
19 to 26.....	75¢ @ 77 1/2¢ 75¢ @ 105
27 to 36.....	70¢ @ 70¢ 70¢ @ 105
Annealed Wire on Spools.....	70¢ @ 70¢ 70¢ @ 105

Brass and Copper Wire on Spools.....	60¢ @ 60¢ 10¢
Brass, list Feb. 26, '96.....	25¢
Copper, list Feb. 26, '96.....	15¢
Cast Steel Wire.....	50¢
Stub's Steel Wire.....	\$6.00 to \$2.40
Wire Clothes Line, see Lines.	
Wire Picture Cord, see Cord.	
Bright Wire Goods—	
List April 1, 1901.....	85¢ @ 10¢
Wire Cloth and Netting—	
Galvanized Wire Netting.....	30¢ @ 30¢
Painted Screen Cloth per 100 ft.....	\$1.00 @ 1.10
Light Hardware Grade:	
2-18 Mesh, Plain (Sc. list) sq. ft.....	1 1/4¢ @ 1 1/4¢
2-18 Mesh, Galv. (Sc. list) sq. ft.....	2 1/4¢ @ 2 1/4¢
Wire, Barb—See Trade Report.	
Wire Rope—See Rope, Wire.	
Wrenches—	
Agricultural.....	70¢ @ 10¢ 75¢ @ 10¢
Case lots.....	75¢ @ 10¢
Acme.....	60¢ @ 10¢
Alligator.....	70¢
Baxter's.....	60¢ @ 10¢
Bull Dog.....	70¢
Bemis & Call's:	
Adjustable.....	35¢ @ 5¢
Adjustable S Pipe.....	40¢
Briggs' Pattern.....	30¢ @ 10¢

Combination Black.....	40¢ @ 5¢
Combination Bright.....	40¢
Cylinder or Gas Pipe.....	35¢
Extra Heavy.....	45¢
Herrick's Pattern.....	50¢
No. 3 Pipe, Bright.....	50¢ @ 10¢
Bindley Automatic.....	30¢
Boardman's.....	33 1/4¢
Coe's Genuine.....	40¢ @ 10¢ 5¢ @ 5¢
Coe's "Mechanics".....	40¢ @ 10¢ 5¢ @ 5¢
Donohue's Engineer.....	40¢ @ 10¢
Eagle Wrenches.....	50¢ @ 10¢
Elgin Monkey Wrench Pipe Jaws.....	33 1/4¢
Gem Pocket.....	30¢
Hercules.....	70¢
Knife Handle, Machinists' (W. & B.):	
Case lots.....	50¢ @ 10¢
Less than case lots.....	50¢ @ 10¢
Improved Pipe (W. & B.).....	60¢
Solid Handles, P.S. & W.....	50¢ @ 50¢ @ 10¢
Triumph.....	60¢ @ 10¢
Wrought Goods—	
Staples, Hooks, etc., list March 17	
'92.....	90¢ @ 90¢ @ 10¢
Yokes Neck—	
Covert Saddle Works, Trimmer 1.60 @ 2.50	
Covert Saddle Works, Neck Yoke	
Centers.....	70¢
Yokes, Ox, and Ox Bows—	
Fort Madison's Farmers & Freighters	
list net	
Zinc—	
Sheet.....	lb 6 1/4¢ @ 6 1/4¢

PAINTS, OILS AND COLORS—Wholesale Prices.

White Lead, Zinc, &c.	
Lead, English white, in Oil.....	94¢
Lead, American White, in Oil:	
Lots of 500 lb or over.....	94¢
Lots less than 500 lb.....	94¢
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	1/4¢
Lead, White, in oil, 12 1/2 lb tin	
pails, add to keg price.....	1/4¢
Lead, White, in oil, 1 to 5 lb as-	
sorted tins, add to keg price.....	1/4¢
Lead, White, Dry in bbls.....	54¢ @ 6
Lead, American, Terms: On lots of 500	
lbs. and over, 60 days, or 2% for cash if	
paid in 15 days from date of invoice.	
Zinc, American, dry.....	43¢ @ 43 1/2¢
Zinc, Paris, Red Seal, dry.....	43¢ @ 43 1/2¢
Zinc, Paris, Green Seal, dry.....	43¢ @ 43 1/2¢
Zinc, Antwerp, Red Seal, dry.....	43¢ @ 43 1/2¢
Zinc, Antwerp, Green Seal, dry.....	43¢ @ 43 1/2¢
Zinc, V. M. French, in Poppy Oil,	
Green Seal:	
Lots of 1 ton and over.....	12¢ @ 12 1/2¢
Lots of less than 1 ton.....	12 1/2¢ @ 12 1/2¢
Zinc, V. M. French, in Poppy Oil,	
Red Seal:	
Lots of 1 ton and over.....	10¢ @ 11 1/4¢
Lots of less than 1 ton.....	11¢ @ 11 1/4¢
Discounts—V. M. French Zinc—Dis-	
counts to buyers of 10 bbl. lots of one or	
assorted grades, 1%: 25 bbls., 2%: 50	
bbls., 4%.	
Dry Colors.	
Black, Carbon.....	8¢ @ 20
Black, Drop, Amer.....	4¢ @ 7
Black, Drop, Eng.....	7¢ @ 11
Black, Ivory.....	12¢ @ 21
Lamp, Com.....	44¢ @ 6
Blue, Celestial.....	4¢ @ 6
Blue, Chinese.....	30¢ @ 35
Blue, Prussian.....	33¢ @ 34
Blue, Ultramarine.....	4¢ @ 20
Brown, Spanish.....	14¢ @ 1
Brown, Vandyke, Amer.....	14¢ @ 2 1/4
Brown, Vandyke, Foreign.....	34¢ @ 34
Carmine, No. 40.....	2¢ @ 2.75
Green, Chrome, ordinary.....	5¢ @ 6 1/2

Green, Chrome, pure.....	18¢ @ 39
Lead, Red, bbls., 1/2 bbls. and kegs:	
Lots 500 lb or over.....	6¢
Lots less than 500 lb.....	6 1/2¢
Litharge, bbls., 1/2 bbls. and kegs:	
Lots 500 lb or over.....	6¢
Lots less than 500 lb.....	6 1/2¢
Ocher, Dutch Washed.....	14¢ @ 1 1/4
Ocher, American.....	10¢ @ 10.00 @ 15.00
Orange Mineral, English.....	8¢ @ 11 1/4
Orange Mineral, French.....	11 3/16¢ @ 11 1/4
Orange Mineral, German.....	8¢ @ 10 1/2
Orange Mineral, American.....	8¢ @ 8 1/4
Red, Indian, English.....	4 1/2¢ @ 5
Red, Indian, American.....	4 1/2¢ @ 5
Red, Turkey, English.....	4¢ @ 4
Red, Tuscan, English.....	7¢ @ 10
Red, Venetian, Amer.....	100¢ @ 1.75
Red, Venetian, English.....	100¢ @ 1.80 @ 3.00
Sienna, Italian, Burnt and	
Powdered.....	34¢ @ 7 1/4
Sienna, Ital., Raw, Powd.....	34¢ @ 7 1/4
Sienna, American, Raw.....	14¢ @ 2
Sienna, American, Burnt and	
Powdered.....	14¢ @ 2
Talc, French.....	100¢ @ 1.35 @ 1.50
Talc, American.....	90¢ @ 1.10
Terra Alba, French.....	95¢ @ 1.00
Terra Alba, English.....	95¢ @ 1.00
Terra Alba, American No. 1.....	85¢ @ 85
Terra Alba, American No. 2.....	45¢ @ 50
Umber, Turkey, Bnt. & Pow.....	24¢ @ 34
Umber, Turkey, Raw & Powd.....	24¢ @ 34
Umber, Bnt. Amer.....	14¢ @ 2
Umber, Raw, Amer.....	14¢ @ 2
Yellow, Chrome.....	10¢ @ 25
Vermilion, American Lead.....	10¢ @ 40
Vermilion, Quicksilver, bulk.....	40¢
Vermilion, Quicksilver, bags.....	47¢
Vermilion, English, Import.....	50¢ @ 65
Vermilion, Chinese.....	\$1.05 @ 1.30
Colors in Oil.	
Black, Lampblack.....	12¢ @ 14
Blue, Chinese.....	36¢ @ 40
Blue, Prussian.....	32¢ @ 38
Blue, Ultramarine.....	13¢ @ 16

Brown, Vandyke.....	94¢ @ 13
Green, Chrome.....	10¢ @ 12
Green, Paris.....	10¢ @ 24
Sienna, Raw.....	10¢ @ 13
Sienna, Burnt.....	10¢ @ 13
Umber, Raw.....	94¢ @ 13
Umber, Burnt.....	94¢ @ 13
Miscellaneous.	
Barytes, Foreign, # ton.....	\$19.00 @ 21.00
Barytes, Amer. floated.....	19.00 @ 20.00
Barytes, Crude, No. 1.....	9.00 @ 10.00
Chalk, in bulk.....	2.50¢ @ 2.60
Chalk, in bbls.....	100¢ @ 35
China Clay, English.....	12.00 @ 17.50
Cobalt, Oxide.....	100¢ @ 2.30 @ 2.50
Whiting, Common.....	100¢ @ .60
Whiting, Olders.....	45¢ @ .65
Whiting, extra Olders.....	55¢ @ .65
Putty.	
In bladders.....	\$2.25
In bulk.....	1.35
In cans, 1 lb to 5 lb.....	3.25
In cans 12 lb to 25 lb.....	3.25
Spirits Turpentine.	
In Southern bbls.....	39¢ @ 39 1/2
In machine bbls.....	39¢ @ 39 1/2
Glue.	
Cabinet.....	11¢ @ 16
Extra White.....	18¢ @ 23
French.....	13¢ @ 16
Irish.....	13¢ @ 16
Low Grade.....	10¢ @ 12
Medium White.....	14¢ @ 16 1/2
Animal, Fish and Vegetable Oils.	
Linseed, City, raw.....	gal 65¢ @ 66

Linseed, City, boiled.....	67¢ @ 68
Linseed, State and West'n, raw.....	52¢ @ 55
Linseed, raw Calcutta seed.....	58¢
Lard, Prime.....	74¢
Lard, Extra No. 1.....	52¢ @ 54
Lard, No. 1.....	45¢ @ 46
Cotton-seed, Crude.....	38¢ @ 40
Cotton-seed, Summer Yellow,	
prime.....	38¢ @ 40
Cotton-seed, Summer Yellow,	
off grades.....	37¢ @ 38
Sperm, Crude.....	60¢ @ 61
Sperm, Natural Spring.....	60¢ @ 61
Sperm, Bleached Spring.....	63¢ @ 65
Sperm, Natural Winter.....	61¢ @ 63
Sperm, Bleached Winter.....	65¢ @ 68
Tallow, Prime.....	57¢
Whale, Crude.....	44¢ @ 46
Whale, Natural Winter.....	44¢ @ 46
Whale, Bleached Winter.....	46¢ @ 48
Menhaden, Crude, Sound.....	30¢ @ 30
Menhaden, Light Strained.....	31¢ @ 33
Menhaden, Bleached Winter.....	31¢ @ 33
Menhaden, Ex Bleached Winter.....	43¢ @ 45
Cocoonut, Ceylon.....	65¢ @ 64
Cocoonut, Ceylon.....	79¢ @ 10
Cod, Domestic.....	30¢ @ 31
Cod, Newfoundland.....	34¢ @ 35
Red Elaine.....	42¢ @ 43
Red Saponified.....	54¢ @ 64
Olive, Italian, bbls.....	58¢ @ 63
Neatafoot, prime.....	52¢ @ 53
Palm, prime, Lagos.....	54¢ @ 54
Mineral Oils.	
Black, 30 gravity, 25 @ 30 cold	
test.....	94¢ @ 10 1/4
Black, 30 gravity, 15 @ 20 cold test.....	104¢ @ 11 1/4
Black, summer.....	94¢ @ 94
Cylinder, light filtered.....	144¢ @ 174
Cylinder, dark filtered.....	114¢ @ 154
Paraffine, 80-90 gravity.....	124¢ @ 134
Paraffine, 90-95 gravity.....	124¢ @ 134
Paraffine, 88-93 gravity.....	124¢ @ 134
Paraffine, red, No. 1.....	124¢ @ 134
In small lots 1/4¢ advance.	

THE IRON AGE.

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